Y4.Ap6/1:D36/5/1987/pt.3

# DEPARTMENT OF DEFENSE APPROPRIATIONS FOR 1987

ORIGINAL

#199)

COMPLETED

960

## HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

HOUSE OF REPRESENTATIVES

NINETY-NINTH CONGRESS

SECOND SESSION

---

SUBCOMMITTEE ON THE DEPARTMENT OF DEFENSE

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# DEPARTMENT OF DEFENSE APPROPRIATIONS FOR 1987

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# HEARINGS

BEFORE A

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## COMMITTEE ON APPROPRIATIONS

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*Deceased, April 10, 1986

# DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1987

WEDNESDAY, MARCH 5, 1986.

## AIRCRAFT PROCUREMENT, ARMY

### WITNESSES

MAJ. GEN. AUGUST M. CIANCIOLO, USA, DIRECTOR OF WEAPONS SYSTEMS, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT AND ACQUISITION

COL. GERALD R. KUNDE, CHIEF, AVIATION DIVISION, WPNS DIRECTORATE, ODCSRDA

### INTRODUCTION

Mr. CHAPPELL. The meeting will come to order

This morning, the committee begins its fiscal year 1987 procurement hearings by considering the Aircraft Procurement, Army appropriation. The fiscal year 1987 budget for this appropriation is $3,264,700,000, a decrease of $86.8 million from the $3,351,514,000 available in fiscal year 1986 after the Gramm-Rudman-Hollings sequestration. As in the recent past, about one-third of the budget is for procurement of the AH-64 Apache attack helicopter. Other major programs are the UH-60 Black Hawk utility helicopter, the CH-47 modernization program, and the Army Helicopter Improvement Program, AHIP. The budget for spares and repair parts is $710.5 million.

As provided by motion duly made and passed February 27th, this hearing is in closed session because of the classified nature of the material to be discussed.

The principal witness is Major General August M. Cianciolo, Director of Weapons Systems, Office of the Deputy Chief of Staff for Research, Development and Acquisition.

General, your complete statement will be made a part of the record and your may summarize it for us at this time.

### SUMMARY STATEMENT OF GENERAL CIANCIOLO

General CIANCIOLO. Thank you, sir. It is my pleasure to be here this morning.

I also have with me, and would like to introduce to you, if I could, Mr. Chairman, Colonel Kunde, who is the Division Chief of the Aviation Division part of my directorate.

I would like to at this time, summarize our FY 87 budget submission for the aircraft procurement Army and if I could have the first slide, please.

[Slide follows:]

# FY 86 VS FY 87 PROCUREMENT REQUEST

---

($ IN BILLIONS)

| | |
|---|---|
| FY 86 PRESIDENT'S BUDGET REQUEST | $21.4B |
| FY 86 APPROPRIATED | $18.8B |
| FY 87 ESTIMATE IN FY 86 BUDGET REQUEST | $24.9B |
| FY 87 PRESIDENT'S BUDGET REQUEST | $18.6B |

General CIANCIOLO. Sir, I would like to just give an overview of the procurement accounts and where the aircraft procurement Army stands in that. As you can see, the delta between FY 87 and 86 budget request in the procurement accounts is shown on the third line there and then the FY 87 budget request is reflected on the bottom line.

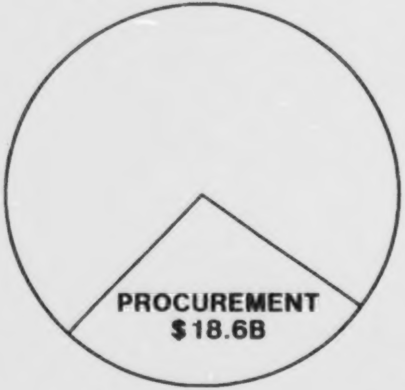
You will notice it is a significant reduction from what we thought we would provide to you in FY 87 back in FY 86.

[Slide follows:]

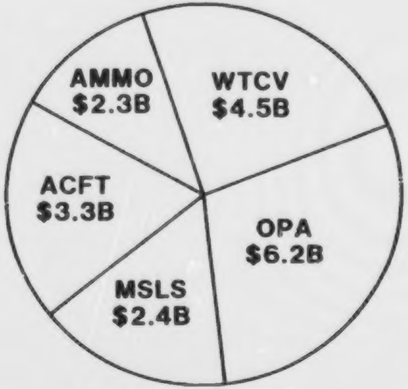
# FY87 PROCUREMENT BUDGET REQUEST

---

THE ARMY BUDGET
($82.0B)



PROCUREMENT BUDGET
($18.6B)*



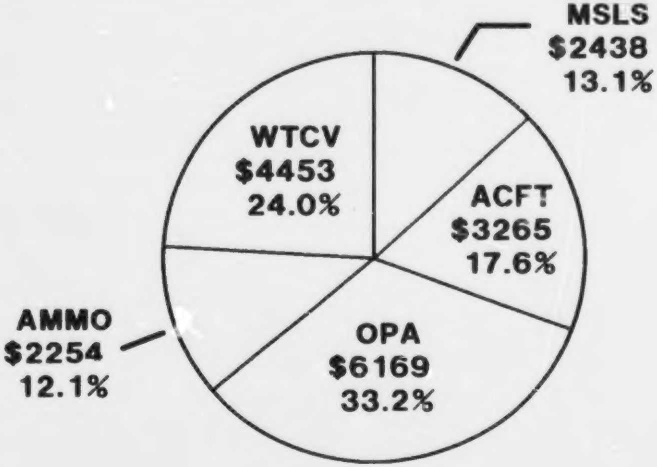
*DOES NOT REFLECT SUM OF COMPONENTS DUE TO ROUNDING.

General Cianciolo. This slide is to put in perspective the total procurement account with regard to the Army budget. You notice it is $18.6 billion of an $82 billion program. That procurement account is broken out into the five appropriations you see on the right chart. Today we are going to be talking about aircraft and as you said, we are talking about a $3.2 billion program.

Next Slide.

[Slide follows:]

# FY 87 PRESIDENT'S BUDGET
# PROCUREMENT - BY APPROPRIATION
# $ - MILLIONS



General CIANCIOLO. To put that in a little better perspective, and to show the percentage of the procurement account which aircraft procurement takes, it is 17.6 percent, or the $3.2 billion.

Next chart, please.

[Slide follows:]

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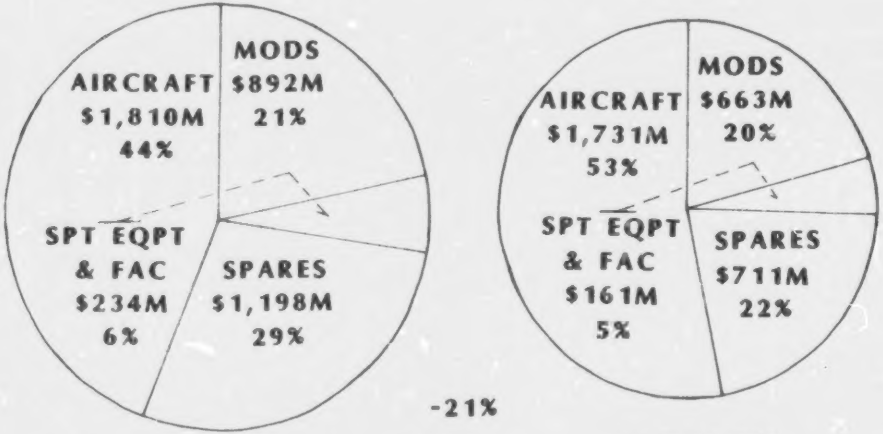
**DEPARTMENT OF THE ARMY**
**OFFICE, DEPUTY CHIEF OF STAFF FOR RESEARCH**
**DEVELOPMENT AND ACQUISITION**



$4,134M -21% -$869.3M $3,264.7M

## AIRCRAFT PROCUREMENT, ARMY BUDGET

General CIANCIOLO. Within the aircraft procurement account, sir, we have four budget activities. One is the aircraft activity and that is the majority of the procurement account. In that account we have—I will cover a little later the major aircraft procurement which are the Black Hawk, Apache, and the UH-60, and that is, of course over half of the budget.

You see the spares make up 21.6 percent and of course the mods and support equipment the remainder.

To give you some idea of the difference between what we provided to the Congress in the FY 87 column, in the FY 86 budget to where we are in the FY 87 budget submit, you will see that we have a 21-percent lower budget request in FY 87 than what we provided in FY 86 for the FY 87 estimates. Our reduction is $869.3 million, and of course that is our piece of the reduction from the total procurement account I showed you earlier.

[Slide follows:]

# AIRCRAFT

## AIRFRAME PROCUREMENT

- 8 ATTACK HEL BN EQUIVALENTS
  MODERNIZED WITH APACHE
  144 AH-64
- 5 COMBAT SPT AVN CO EQUIVALENT
  MODERNIZED WITH BLACK HAWK
  78 UH-60
- 6 CEWI AVN PLT EQUIVALENTS
  MODERNIZED WITH QUICK FIX
  18 EH-60

General CIANCIOLO. In the aircraft account or the budget activity called aircraft procurement, we propose to buy 146 Apaches, excuse me, 144 Apaches, which is the equivalent of 8 AH-64 attack helicopter battalions. That is what is to be the procurement account FY 87 request.

With regard to the Black Hawks, we are asking for 78 Black Hawks, and that is to support five combat support aviation companies and then 18 EH-60, which are Quickfix II electronic warfare aircraft, a derivative of the Black Hawk aircraft, and support our Electronic warfare battalions, which are organic to our divisional forces within the Army.

Next slide, please.

[Slide follows:]

## MODERNIZATION MODS

---

- 3 MEDIUM HEL CO EQUIVALENTS
  EQUIPPED WITH MOD CHINOOK
  48 CH-47D

- 3 ATTACK HEL BN EQUIVALENTS
  EQUIPPED WITH MOD AHIP
  48 OH-58D

General Cianciolo. Within budget activity two, which is the mod program we are asking for the 48 CH-47D. That is part of the multiyear contract. That will provide the equivalent of three medium helicopter battalions within the Army.

Of course, with the AHIP or OH-58D we show the equivalent of three attack helicopter battalions, with regard to the AHIP program now, since we are procuring them for the field artillery, aerial observer role, that could be stated as the equivalent of eight divisions receiving their complement of six OH-58D AHIP Field Artillery Aerial Observer aircraft.

[Slide follows:]

# SPARES AND REPAIR PARTS

---

- INITIAL
- REPLENISHMENT
- WAR RESERVE

General CIANCIOLO. Within the spares account, of course the spares is broken into three subcategories, initial spares, replenishment spares and war reserves and we will discuss in some detail.
[Slide follows:]

## SUPPORT EQUIPMENT AND FACILITIES

- AVIONICS
- COMMON GROUND EQUIPMENT
- SYNTHETIC FLIGHT TRAINERS
- INDUSTRIAL FACILITIES

General CIANCIOLO. With regard to initial spares, all new aircraft that are procured are procured with their initial spares.

With regard to the last final budget activity, the appropriations of course include these four subcategories, our avionics, which includes ASE equipment, aircraft survivability equipment, avionics, equipment, common ground support equipment, power supplies, our simulators.

Sir, that completes my overview of the FY 87 submit, the summarized statement for the record. I am prepared to answer any of your questions.

[General Cianciolo's statement follows:]

STATEMENT BY MAJOR GENERAL AUGUST CIANCIOLO
ON FY 87 ARMY AVIATION PROGRAMS
FOR THE HOUSE APPROPRIATIONS COMMITTEE
5 MARCH 1986

Mr. CHAIRMAN, MEMBERS OF THE SUBCOMMITTEE, I AM MAJOR GENERAL AUGUST M. CIANCIOLO, DIRECTOR, WEAPONS SYSTEMS DIRECTORATE, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT, AND ACQUISITION FOR THE DEPARTMENT OF THE ARMY. MY BRIEFING WILL ADDRESS THE PRESIDENT'S FY 87 BUDGET REQUEST FOR AIRCRAFT PROCUREMENT.

THE ARMY AVIATION PROCUREMENT REQUEST FOR FY 1987 IS $3264.7 MILLION. THE FY 87 BUDGET REQUEST IS BROKEN OUT BY BUDGET ACTIVITY.

AIRCRAFT PROCUREMENT, ARMY
FY 1987
($ IN MILLIONS)

| BUDGET ACTIVITY | FY 1987 |
|---|---|
| 1 - AIRCRAFT | $1730.7 |
| 2 - MODIFICATION OF AIRCRAFT | 662.6 |
| 3 - SPARES AND REPAIR PARTS | 710.5 |
| 4 - SUPPORT EQUIPMENT AND FACILITIES | 160.9 |
| APPROPRIATION TOTAL | $3264.7 |

I WILL ADDRESS THE REQUESTED FUNDING BY MAJOR ITEMS UNDER EACH OF THESE FOUR BUDGET ACTIVITIES.

ACTIVITY 1, AIRCRAFT, PROVIDES FOR THE PROCUREMENT AND MANUFACTURE OF AIRPLANES, HELICOPTERS, ASSOCIATED AIRCRAFT ARMAMENT AND AVIONICS EQUIPMENT. MAJOR FISCAL YEAR 1987 BUYS WILL BE:

| | | ($ IN MILLIONS) FY 1987 | |
|---|---|---|---|
| EH-60 | ELECTRONIC HELICOPTER & ADV PROC | (18) | 151.9 |
| AH-64 | ATTACK HELICOPTER & ADV PROC | (144) | 1228.4 |
| UH-60 | BLACK HAWK HELICOPTER & ADV PROC | (78) | 350.4 |
| | ACTIVITY TOTAL | | $1730.7 |

I WILL NOW ADDRESS EACH OF THESE THREE AIRCRAFT UNDER ACTIVITY 1 ALONG WITH THE HELLFIRE MISSILE, THE MAIN ARMAMENT FOR AH-64 APACHE.

EH-60A QUICKFIX HELICOPTER

o THE EH-60 IS A HELIBORNE ELECTRONIC WARFARE SYSTEM.
o THE SYSTEM HAS COMMUNICATIONS INTERCEPT, JAMMING AND DIRECTION FINDING (DF) CAPABILITIES.
o MISSION ELECTRONICS ARE CONFIGURED IN A MODIFIED BLACK HAWK HELICOPTER.

FUNDING ($ IN MILLIONS)

| | FY 86 & PRIOR | FY 87 | COST TO COMPLETE | TOTAL |
|---|---|---|---|---|
| PROCUREMENT (W/SPARES) | 469.4 | 171.2 | CLASSIFIED | |

775.4

FY 87 RDTE: NONE.

FY 87 PROCUREMENT: CONTINUES EH-60A PROCUREMENT PROGRAM WITH A BUY OF 18 EH-60A AIRCRAFT.

THE EH-60, QUICKFIX SYSTEM WILL ALSO BE FIELDED TO THE NATIONAL GUARD AND THE ARMY RESERVE. $19.3 MILLION IS FOR INITIAL SPARES.

AH-64 ADVANCED ATTACK HELICOPTER

O SINGLE ROTOR, TWO PLACE ADVANCED ANTIARMOR ATTACK HELICOPTER.
O PRIMARY ARMAMENT - HELLFIRE MISSILE.
O ADDITIONAL ARMAMENT - 30MM GUN AND HYDRA 70 ROCKETS.

FUNDING ($ IN MILLIONS)

| | FY 1986 & PRIOR | FY 1987 | COST TO COMPLETE | TOTAL |
|---|---|---|---|---|
| PROCUREMENT (W/SPARES) | 5540.2 | 1342.0 | 947.7 | 7829.9 |

FY 87 RDTE: R&D FOR OPTICAL IMPROVEMENT PROGRAM.

FY 87 PROCUREMENT: BUYS 144 AH-64S, $1136 MILLION IS FOR INITIAL SPARES, AND $39.1 MILLION IS FOR LONG LEAD ITEMS FOR 78 AIRCRAFT FOR FISCAL YEAR 1988 PROCUREMENT.

THE FY 87 BUDGET REQUEST FOR THE AH-64 APACHE IS FOR PROCUREMENT OF 144 HELICOPTERS IN THE SIXTH YEAR OF PROCUREMENT. THE SECOND APACHE PRODUCTION CONTRACT, AWARDED IN FISCAL YEAR 1983, COMPLETED DELIVERY TO THE ARMY IN DECEMBER 1985. THE ARMY NEEDS AN IMPROVED TANK KILLING CAPABILITY TO DEFEAT WARSAW PACT ARMOR, DAY OR NIGHT, AND IN ADVERSE WEATHER. APACHE HAS BEEN DESIGNED TO PROVIDE THESE ADVANTAGES AND WILL BE RELIED UPON AS A PRINCIPAL

ANTIARMOR WEAPON. THE AH-64 ADDITIONALLY PROVIDES A MOBILE ANTIARMOR CAPABILITY TO THE RAPID DEPLOYMENT FORCES. MAIN ARMAMENT WILL BE THE HIGHLY LETHAL AND ACCURATE HELLFIRE MISSILE.

THE HELLFIRE MISSILE IS THE PRIMARY ARMAMENT OF THE AH-64 WHICH IS NOT A PART OF THE AIRCRAFT PROCUREMENT, ARMY FUNDING BUT IS INCLUDED IN THE MISSILE PROCUREMENT, ARMY ACCOUNT. THERE IS NO FY 87 PROCUREMENT PLANNED BECAUSE OF LATE DELIVERIES.

## UH-60A BLACK HAWK HELICOPTER

- o TWIN ENGINE, SINGLE ROTOR UTILITY TACTICAL TRANSPORT HELICOPTER.
- o DESIGNED TO PERFORM THE ARMY AIR ASSAULT, AIR CAVALRY AND AEROMEDICAL EVACUATION MISSIONS.
- o WITH A CREW OF 3, CARRIES UP TO 14 COMBAT EQUIPPED TROOPS OR AN EQUIVALENT CARGO LOAD.
- o DESIGNED TO OPERATE IN ALL INTENSITIES OF CONFLICT IN ALL EXPECTED GEOGRAPHICAL ENVIRONMENTS.
- o DEMONSTRATED FIELD PERFORMANCE IS HIGHLY PRAISED BY FIELD COMMANDERS AND TROOPS.

FUNDING ($ IN MILLIONS)

| | FY 86 & PRIOR | FY 87 | COST TO COMPLETE | TOTAL |
|---|---|---|---|---|
| PROCUREMENT (W/SPARES) | 4095.6 | 355.0 | 1396.0 | 5846.6 |

FY 87 RDTE: NONE.

FY 87 PROCUREMENT: FUNDS PRODUCTION OF 78 UH-60A BLACK HAWKS AND ADVANCE PROCUREMENT FUNDING FOR FOLLOW-ON FY 88-90 AIRFRAME MULTIYEAR PROCUREMENT. FUNDING INCLUDES $195.0 MILLION FOR ADVANCE PROCUREMENT AND $4.6 MILLION FOR INITIAL SPARES. AS OF 31 JAN 86, 707 BLACK HAWKS HAVE BEEN DELIVERED TO THE ARMY.

ACTIVITY 2, MODIFICATIONS OF AIRCRAFT, PROVIDES FOR MODIFICATION OF ITEMS AND UPGRADE OF EQUIPMENT PROCURED BY THIS APPROPRIATION. THIS RESULTS IN AN END ITEM RECONFIGURED TO A NEW SERIES DESIGNATION OR NEW OPERATIONAL CAPABILITY. MAJOR ITEMS IN THIS ACTIVITY ARE:

| | | ($ IN MILLIONS) |
|---|---|---|
| AH-1S COBRA-TOW HELICOPTER | | 61.0 |
| CH-47 CHINOOK HELICOPTER AND ADV PROC | | 267.0 |
| ARMY HELICOPTER IMPROVEMENT PROGRAM AND ADV PROC | | 210.3 |
| OTHER | | 124.3 |
| OV-1 MOHAWK AIRPLANE | ($24.9) | |
| AIRPLANE, RECON, RV-1 | ($2.7) | |
| AH-64 MODS | ($33.4) | |
| HELICOPTER, CARGO, CH-54 | ($1.3) | |
| HELICOPTER, UTILITY, UH-1 | ($6.3) | |
| UH-60A (BLACK HAWK) | ($7.7) | |
| AIR-TO-AIR STINGER MODS | ($28.8) | |
| AIRBORNE AVIONICS | ($.1) | |
| ASE MODS COMBAT | ($3.5) | |
| MODIFICATIONS UNDER $2.0 | ($.1) | |
| AIRCRAFT 9WW | ($12.0) | |
| SOF AIRCRAFT MODS | ($3.5) | |
| ACTIVITY TOTAL | | $662.6 |

THE THREE HIGHEST DOLLAR MODIFICATIONS WILL BE DISCUSSED SEPARATELY.

## AH-1S COBRA/TOW

| | FY 86 & PRIOR | FY 87 | COST TO COMPLETE | TOTAL |
|---|---|---|---|---|
| PROCUREMENT (W/SPARES) | | | | |
| MODIFICATION (PIP) | 1347.7 | 67.5 | 145.5 | 1560.7 |
| NEW PRODUCTION | 1129.5 | 0 | 0 | 1129.5 |
| TOTAL | 2477.2 | 67.5 | 145.5 | 2690.2 |

FY 87 RDTE: NONE.

THE AH-1S COBRA/TOW IS WIDELY DEPLOYED IN BOTH EUROPE AND KOREA AND WILL COMPLEMENT THE AH-64 WHEN THAT SYSTEM IS DEPLOYED. THE FY 87 PROCUREMENT APPROPRIATION CONTINUES FUNDING FOR THE COBRA FLEET LIFE EXTENSION PROGRAM AND THE COBRA NIGHT FLIR PROGRAM. $6.5 MILLION IS FOR SPARES.

## CH-47 (CHINOOK) MODERNIZATION

- o TANDEM ROTOR/TWIN ENGINE MEDIUM LIFT HELICOPTER.
- o MODERNIZES ALL A, B, AND C MODELS INTO CH-47D, STANDARD FLEET.
- o IMPROVES PERFORMANCE, RELIABILITY, AVAILABILITY, MAINTAINABILITY AND REDUCES VULNERABILITY.
- o EXTENDS FLEET LIFE PAST YEAR 2000.

| | FUNDING ($ IN MILLIONS) | | | |
|---|---|---|---|---|
| | FY 86 & PRIOR | FY 87 | COST TO COMPLETE | TOTAL |
| PROCUREMENT (W/SPARES) | 2183.5 | 277.1 | 1276.9 | 3737.5 |

FY 87 RDTE: NONE.

FY 87 PROCUREMENT: FUNDS MODERNIZATION OF 48 CH-47 HELICOPTERS TO CH-47D CONFIGURATION, TERMINATION LIABILITY FOR LONG LEAD FOR FY 87 AND FY 88 PROCUREMENT, AND INITIAL SPARES.

TOTAL PROCUREMENT IN THE FY 87 BUDGET REQUEST IS $277.1 MILLION. OF THAT AMOUNT, $267.0 MILLION IS PECULIAR TO THE CH-47D. THE BALANCE, $10.1 MILLION, FUNDS ESSENTIAL MODIFICATIONS TO THE FLEET AND FLEET SPARES. THE CH-47D CONFIGURATION IS FIXED, THE PROGRAM IS NOT TEST DEPENDENT AND THERE ARE NO TECHNICAL PROBLEMS. ALL CONTRACTS HAVE BEEN EXECUTED WITHIN COST AND ON SCHEDULE. DELIVERIES BEGAN IN 1982 AND IOC OF THE FIRST UNIT WAS ATTAINED AT FT. CAMPBELL IN FEBRUARY 1984.

## ARMY HELICOPTER IMPROVEMENT PROGRAM

- O MODIFICATION OF EXISTING OH-58A AIRFRAME - 578 TOTAL CONVERSION.
- O HAS IMPROVED FLIGHT PERFORMANCE AND MAST MOUNTED SIGHT WITH:
  - oo LASER DESIGNATOR/RANGE FINDER.
  - oo THERMAL IMAGING SYSTEM (NIGHT SIGHT).
  - oo TELEVISION.
  - oo IN FLIGHT BORESIGHT OF LASER, NIGHT SIGHT AND TV.
- O ASARC AND DSARC III COMPLETED FY 85.
- O 60 AHIPS ON PRODUCTION CONTRACT, DELIVERIES ON SCHEDULE, 39 APPROPRIATED.
- O MAR-JUN 87 CONDUCT FOLLOW-ON EVALUATION
- O AUG-SEP 87 ASARC/DSARC IIIA

| | FUNDING ($ IN MILLIONS) | | | |
|---|---|---|---|---|
| | FY 86 & PRIOR | FY 87 | COST TO COMPLETE | TOTAL |
| PROCUREMENT (W/SPARES) | 707.0 | 246.7 | 1729.0 | 2682.7 |

FY 87 RDTE: NONE.

FY 87 PROCUREMENT: 48 AIRCRAFT IN FY 87 REQUEST.

THE $246.7 MILLION IN FY 87 PROCUREMENT FUNDS WILL PROVIDE FOR THE FOURTH PRODUCTION OPTION FOR 48 AIRCRAFT. THIS INCLUDES $45.4 MILLION FOR ADVANCE PROCUREMENT FOR FY 88 OPTION FOR 32 AIRCRAFT AND $36.4 MILLION FOR INITIAL SPARES.

IN OT II AHIP SUCCESSFULLY DEMONSTRATED THE EFFECTIVENESS OF THE AIRCRAFT'S MISSION EQUIPMENT PACKAGE; HOWEVER, OBSERVED SHORTCOMINGS IN TRAINING, TACTICAL EMPLOYMENT AND TEST DISCIPLINE LED TO LESS THAN EXPECTED EFFECTIVENESS IN ATTACK AND SCOUT ROLES. AS A RESULT, OSD LIMITED PROCUREMENT TO THE FIELD ARTILLERY AERIAL OBSERVER ROLE UNTIL ADDITIONAL TESTING AND OSD REVIEW. BOTH WILL OCCUR IN FY 87. PREPARATIONS FOR THAT TEST AND REVIEW ARE ON TRACK. CURRENTLY 60 AHIPS ARE ON PRODUCTION CONTRACT AND DELIVERIES TO THE ARMY ON SCHEDULE. THE LOT 3 CONTRACT AWARD FOR 39 AHIPS IS EXPECTED IN AUGUST THIS YEAR AFTER AN ARMY "SHOULD COST" ANALYSIS.

## SPARES AND REPAIR PARTS

ACTIVITY 3, SPARES AND REPAIR PARTS, INCLUDES FUNDS FOR INITIAL SPARES TO SUPPORT A NEW OR MODERNIZED AIRCRAFT SYSTEM AND REPLENISHMENT SPARES INCLUDING PEACETIME AND WAR RESERVE SPARES REQUIRED TO MAINTAIN THE FLEET ONCE FIELDED.

| | |
|---|---|
| INITIAL | $213.6 |
| REPLENISHMENT (PEACETIME) | $398.0 |
| REPLENISHMENT (WARTIME) | $ 98.9 |
| ACTIVITY TOTAL | $710.5 |

AIRCRAFT END ITEMS SUPPORTED BY INITIAL SPARES IN FY 86 AREA: ($ MILLIONS)

| | | | | | |
|---|---|---|---|---|---|
| AH-64 | 113.6 | UH-60A | 4.6 | AH-1S | 6.5 |
| OV-1 | 3.0 | | | GROUND SUPPORT EQUIP | .8 |
| EH-60A | 19.3 | CH-47 | 9.6 | NIGHT VISION GOGGLES | 2.6 |
| RC-12D | 5.1 | AHIP | 36.4 | SINCGARS | .8 |
| | | | | ASE & AVIONICS | 11.3 |

THE REPLENISHMENT SPARES (PEACETIME) REQUIREMENT SUPPORTS THE FOLLOWING SYSTEMS: ($ MILLION)

| | | | |
|---|---|---|---|
| AHIP | 8.7 | AH-64 | 95.0 |
| UH-1 | 40.1 | OH-58/OH-6 | 11.2 |
| AH-1 | 62.9 | OV-1/RV-1 | 4.8 |
| UH-60 | 105.9 | U-8/U-21 | .6 |
| CH-47 | 16.0 | COMMUNICATIONS, ELECTRONICS, GROUND SUPPORT EQUIP & MISC | 44.9 |
| CH-54 | 7.9 | | |

ACTIVITY 4, SUPPORT EQUIPMENT AND FACILITIES FUNDS FOR AVIONICS, FLIGHT SIMULATORS, GROUND SUPPORT EQUIPMENT AND THE PRODUCTION BASE SUPPORT ITEMS: MAJOR LINES ARE:

| | | |
|---|---|---|
| AIRCRAFT SURVIVABILITY EQUIPMENT | | 11.6 |
| AVIONICS SUPPORT EQUIPMENT | | 57.9 |
| COMMON GROUND EQUIPMENT | | 28.4 |
| SYNTHETIC FLIGHT TRAINING SYSTEMS (3) | | 37.7 |
| INDUSTRIAL FACILITIES | | 16.0 |
| OTHER | | 9.3 |
| AIR TRAFFIC CONTROL | (4.8) | |
| WAR CONSUMABLES | (4.5) | |
| ACTIVITY TOTAL | | 160.9 |

OUR LAST ACTIVITY, SUPPORT EQUIPMENT, HAS FIVE MAJOR LINES FOR DISCUSSION AIRCRAFT SURVIVABILITY EQUIPMENT, AVIONICS SUPPORT EQUIPMENT, COMMON GROUND EQUIPMENT, SYNTHETIC FLIGHT TRAINING SYSTEMS, AND INDUSTRIAL FACILITIES.

### AIRCRAFT SURVIVABILITY EQUIPMENT (ASE)

- ON-GOING RDTE AND PROCUREMENT
- COORDINATED, JOINT SERVICE AREA
- TAILORED ASE SUITES FOR ALL PRIORITY AIRCRAFT

THE ARMY AIRCRAFT SURVIVABILITY EQUIPMENT PROGRAM IS A CONTINUING PROCUREMENT PROGRAM WITH ARMY LEADERSHIP SUPPORT. PROGRAM IS DESIGNED TO STAY ABREAST OF EVOLVING TECHNOLOGIES AND THREATS. FY 87 FUNDS WILL PROCURE AN/ALQ-156 MISSILE DETECTORS FOR SEMA AIRCRAFT AND CONTINUE PROCUREMENT OF THE AN/APR-39A RADAR WARNING RECEIVER. MODIFICATION MONEY WILL MODIFY OVER 3000 IP-1150 COCKPIT DISPLAYS ALREADY IN THE ARMY FLEET TO INTERFACE WITH THE NEW DIGITAL, ALPHA-NUMERIC AN/APR-39A.

### AVIONICS SUPPORT EQUIPMENT

- INITIAL PROCUREMENT OF GLOBAL POSITIONING SYSTEM (GPS) NAVSTAR. DELAYED ONE YEAR TO RESOLVE RELIABILITY ISSUES.
- CONTINUE PROCUREMENT OF SINCGARS AIRBORNE RADIOS AND NOE COMMUNICATIONS.
- CONTINUE PROCUREMENT OF AN/AVS-6 THIRD GENERATION NIGHT VISION GOGGLES.

COMPLETE PROCUREMENT OF THE POSITION LOCATION REPORTING SYSTEM (PLRS).

FUNDING ($ MILLIONS)

| | FY 86 & PRIOR | FY 87 | COST TO COMPLETE | TOTAL |
|---|---|---|---|---|
| PROCUREMENT | 222.9 | 57.9 | CONTINUING | N/A |
| SPARES | 13.2 | 3.4 | CONTINUING | N/A |

### COMMON GROUND EQUIPMENT

- PROVIDE ESSENTIAL EQUIPMENT TO MAINTAIN ARMY AIRCRAFT FLEET.
- ENHANCE READINESS THROUGH BETTER AIRCRAFT AVAILABILITY AND SHORTER TIMES TO REPAIR.
- INCREASES SAFETY AND SURVIVABILITY OF AIRCREWS.

FUNDING ($ IN MILLIONS)

| | FY 86 & PRIOR | FY 87 | COST TO COMPLETE TOTAL |
|---|---|---|---|
| PROCUREMENT (W/SPARES) | 302.9 | 28.4 | CONTINUING |

FY 87 PROCUREMENT: IN OUR COMMON GROUND EQUIPMENT LINE IS A REQUEST FOR $12.8 MILLION FOR AVIATION GROUND SUPPORT EQUIPMENT AND SETS, KITS, AND OUTFITS. THESE ITEMS ARE REQUIRED TO PERFORM MAINTENANCE AND REPAIR ON OUR AIRCRAFT FLEET. FY 87 PROCUREMENT INCLUDES THE THIRD YEAR OF A THREE YEAR MULTIYEAR FOR AVIATION GROUND POWER UNITS USED FOR APACHE AND BLACK HAWK FLEETS, DIVISIONAL AVIATION INTERMEDIATE MAINTENANCE TOOL SETS AND SHELTERS, TEST AND CALIBRATION SETS FOR AVIONICS, AND AIRFIELD SUPPORT EQUIPMENT FOR ARMY AIRFIELDS. OVERALL, THIS LINE HELPS ENHANCE FLEET READINESS.

[illegible] AVAILABLE

I WOULD NEXT LIKE TO DISCUSS THE ARMY'S FLIGHT SIMULATOR PROGRAM. THE OBJECTIVE OF THIS PROGRAM IS TO DEVELOP AND PROCURE FULL COMBAT MISSION FLIGHT SIMULATORS THAT ALLOW FOR PILOT AND AIRCREW TRAINING. IT IS AIMED AT IMPROVING FLIGHT TRAINING EFFICIENCY THROUGH INCREASED USE OF FLIGHT SIMULATORS FOR FLIGHT AND WEAPONS TRAINING.

SYNTHETIC FLIGHT TRAINING SYSTEMS

- COMPUTER DRIVEN FLIGHT, WEAPON AND MISSION SIMULATORS FOR THE UH-1, UH-60, AH-1, AH-64, AND CH-47 HELICOPTERS.
- ADVANCED TECHNOLOGY SIMULATORS WITH COCKPIT WINDOW VISUAL PRESENTATIONS FOR TACTICAL, NAP-OF-THE-EARTH FLIGHT, AND AERIAL GUNNERY SIMULATION WITH ENEMY INTERACTION.

| | FUNDING ($ IN MILLIONS) FY 86 & PRIOR | FY 87 | COST TO COMPLETE | TOTAL |
|---|---|---|---|---|
| PROCUREMENT | 617.9 | 37.7 | CONTINUING | N/A |

FY 87 PROCUREMENT: PROCURE 3 UH-60 SIMULATORS.

THERE ARE CURRENTLY 22 UH-1 SIMULATORS FIELDED: 15 ARE LOCATED AT STATESIDE LOCATIONS AND THE BALANCE ARE IN KOREA AND EUROPE. WE HAVE PROTOTYPES OF THE CH-47 CHINOOK, THE AH-1 COBRA, AND UH-60 BLACK HAWK SIMULATORS IN USE FOR PILOT TRAINING AT THE ARMY AVIATION CENTER, FT. RUCKER, ALABAMA. WE HAVE FIELDED PRODUCTION MODEL CH-47C FLIGHT SIMULATORS AT FORT CAMPBELL, FORT HOOD, AND IN GERMANY AND FOUR PRODUCTION MODEL AH-1 COBRA FLIGHT WEAPONS SIMULATORS AT FORT HOOD, HANAU, GERMANY, AND FORT CAMPBELL AND FORT LEWIS. WE ARE REQUESTING $37.7 MILLION FOR PROCUREMENT OF 3 UH-60 FLIGHT SIMULATORS - ONE EACH FOR FORT HOOD, KOREA AND FORT WAINWRIGHT.

THE RETURN RECEIVED ON OUR INVESTMENT IN FLIGHT SIMULATORS IS SUPERB. IN DOLLARS AND CENTS, FLIGHT SIMULATORS PROVIDE SIGNIFICANT FLYING HOUR COST AVOIDANCE. OF EQUAL IMPORTANCE, HOWEVER, IS THE FACT THAT THESE FLIGHT SIMULATORS PROVIDE EFFECTIVE TRAINING. THROUGH SIMULATION WE ARE ABLE TO TRAIN OUR PILOTS AND AIRCREWS, AND THROUGH SIMULATION WE CAN OVERCOME TRAINING LIMITATIONS - WEATHER, SAFETY, COST, ETC. THE END RESULT IS THAT FLIGHT SIMULATORS IMPROVE OUR ARMY'S LEVEL OF READINESS.

INDUSTRIAL FACILITIES

- EXPAND AND MAINTAIN THE INDUSTRIAL BASE.
- PROVIDE INCENTIVES TO IMPROVE CONTRACTOR EFFICIENCY.
- MAINTAIN GOVERNMENT OWNED PLANT AND EQUIPMENT.
- ESTABLISH AND MAINTAIN DEPOT REPAIR CAPABILITY.

| | FUNDING ($ IN MILLIONS) FY 86 & PRIOR | FY 87 | COST TO COMPLETE | TOTAL |
|---|---|---|---|---|
| PROCUREMENT | 283.6 | 16.0 | CONTINUING | N/A |

FY 87 PROCUREMENT: WITHIN THE REQUEST FOR INDUSTRIAL FACILITIES IS $7.7 MILLION FOR DEPOT MAINTENANCE PLANT EQUIPMENT (DMPE). DMPE PROVIDES FUNDING FOR THE UPGRADE, REBUILD, REHABILITATION AND REMANUFACTURE OF DEPOT EQUIPMENT. INCLUDED IN THE FY 87 REQUEST ARE FUNDS TO UPGRADE MAINZ ARMY DEPOT TO ACCOMMODATE APACHE COMPONENTS, UPGRADE ANNISTON ARMY DEPOT TO ENHANCE THE REPAIR CAPABILITY AND UPGRADE THE GUARDRAIL V REPAIR/OVERHAUL CAPABILITY AT SACRAMENTO ARMY DEPOT.

ALSO INCLUDED IN THIS FUNDING LINE IS $8.3 MILLION FOR THE PROVISION OF INDUSTRIAL FACILITIES( PIF). PIF FUNDING IS USED FOR THE DESIGN, ACQUISITION, PROCUREMENT AND CONSTRUCTION OF FACILITIES AND EQUIPMENT IN GOVERNMENT OWNED CONTRACTOR OPERATED FACILITIES AS WELL AS SELECTED CONTRACTOR OWNED CONTRACTOR OPERATED PLANTS. IT IS THRU PIF FUNDING THAT WE EXPAND AND MAINTAIN THE INDUSTRIAL BASE. IN FY 87 PIF FUNDING IS PROJECTED TO BE USED FOR THE REHABILITATION OF GOVERNMENT OWNED FACILITIES AT THE STRATFORD ARMY ENGINE PLANT AS WELL AS UPGRADING GOVERNMENT OWNED EQUIPMENT IN SEVERAL CONTRACTOR OWNED FACILITIES. THESE PIF PROJECTS SUPPORT CURRENT PRODUCTION OF CH-47, UH-60, AND AH-1S COMPONENTS. OVER THE LAST FEW YEARS, WITH YOUR COMMITTEE'S SUPPORT, WE HAVE ENHANCED THE ARMY'S PREPAREDNESS. THE UH-60A BLACK HAWK PROGRAM CONTINUES TO BE AN EXCELLENT EXAMPLE. AS OF 31 JAN 86, 707 AIRCRAFT HAVE BEEN DELIVERED TO THE ARMY AND ARE OPERATIONAL IN VARIOUS UNITS OF OUR FORCES COMMAND, US ARMY EUROPE, KOREA, PANAMA AND WESTCOM. THESE DELIVERIES WILL BE FOLLOWED BY CONTINUATION OF FIELDING TO TRADOC AND FORSCOM UNITS, USAR/ARNG AND USAREUR (MEDEVAC). THE OPERATIONAL SUCCESSES OF THIS PROGRAM ARE AUGMENTED BY THE COST DISCIPLINES AND RESOURCE CONSERVATION RESULTING FROM MULTIYEAR PROCUREMENTS. IN THE FY 82-84 MULTIYEAR AIRFRAME PROCUREMENT THE ARMY REALIZED AN ESTIMATED

PROGRAM SAVINGS OF $81.1 MILLION OVER THE AWARD OF THREE SINGLE YEAR PROCUREMENTS. ADDITIONAL PROGRAM SAVINGS ESTIMATED AT $129.5 MILLION WERE ACHIEVED AS A RESULT OF THE FY 85-87 AIRFRAME MULTIYEAR CONTRACT. THE PROGRAM ALSO REALIZED SAVINGS OF $14.8 MILLION ON THE FY 83-85 MULTIYEAR PROCUREMENT OF THE T-700 ENGINE FOR THE BLACK HAWK AND ESTIMATES $31.2 MILLION IN SAVINGS IN THE FY 86-88 MULTIYEAR ENGINE CONTRACT. THE MODERNIZATION PROGRAM FOR THE CH-47D CHINOOK, ESSENTIALLY PRODUCED A NEW HELICOPTER, BUT AT A COST SUBSTANTIALLY LESS THAN A NEW AIRCRAFT. THE CURRENT CH-47D PROGRAM IS ON SCHEDULE AND HAS BEEN EXECUTED WITHIN COST. THE CH-47D DELIVERIES BEGAN IN MAY 1982, AND INITIAL OPERATIONAL CAPABILITY (IOC) WAS ATTAINED IN THE FIRST UNIT WITHIN THE 101ST AIRBORNE DIVISION ON FEBRUARY 28, 1984. OVER THE PAST YEAR THE CH-47D AIRCRAFT HAS ACHIEVED HIGH USER SATISFACTION. THE CH-47 MODERNIZATION PROGRAM HAS BEEN APPROVED FOR MULTIYEAR PROCUREMENT WITH AN FY 85 CONTRACT AWARD. THIS WILL PROVIDE ADDITIONAL PROGRAM AND INDUSTRIAL BASE STABILITY AS WELL AS A COST SAVING OF APPROXIMATELY $125.0 MILLION. THESE ARE JUST TWO EXAMPLES OF THE MODERNIZATION AND COST DISCIPLINES WHICH WE HAVE UNDERWAY. WE APPRECIATE YOUR SUPPORT AND SOLICIT YOUR CONTINUED INTEREST IN THESE ARMY AVIATION PROGRAMS. MR. CHAIRMAN, THIS CONCLUDES MY PREPARED STATEMENT.
THANK YOU.

## IMPACT OF GRAMM-RUDMAN-HOLLINGS

Mr. CHAPPELL. General, what impact is Gramm-Rudman-Hollings going to have on your procurement?

General CIANCIOLO. Sir, the Gramm-Rudman-Hollings had impact of course in our FY85-FY86 accounts. The reductions that we are looking at in FY84-85 were based on unobligated balances that we had within those accounts.

With regard to FY 86, those reductions impacts will be based on program stretch-outs, reduction somewhat in our contingency funding for those programs. With regard to specific programs, such as the AH-64, the AHIP, I can't tell you now because we are still in the process of negotiating the contracts for those programs, and so I don't know whether we will have a reduction in quantity or not. Our plan is to continue to buy 144 Apaches, and 39 AHIP's, and of course 78 Black Hawks.

### T-700 ENGINE

Mr. CHAPPELL. The sequestration for FY 86 was $172,686,000. The Navy protected its multityear contracts from sequestration, the Army did not. What impact is it going to have on the T-700 engine?

General CIANCIOLO. Right now the 700 engine multiyear contract will not be affected because it has, as I understand, options to—excuse me—right now, we are in the second year of the three year multiyear on the 700 engine. We don't know of any reduction in the amount of engines because of Gramm-Rudman impact on that program.

The contract has been negotiated. There may be a reduction in contingencies, but we do not plan to reduce, to have any reductions in the quantities.

### BLACK HAWK

Mr. CHAPPELL. On the Black Hawk, what did you say the impact was?

General CIANCIOLO. Excuse me?

Mr. CHAPPELL. What was the impact on Black Hawk program?

General CIANCIOLO. Right now, sir, there has been no impact on the reduction of quantities with regard to the Black Hawk program reported to us.

### CH-47

Mr. CHAPPELL. How about the CH-47?

General CIANCIOLO. Well, CH-47 will not have any reduction in quantities. I think we have chosen to reduce our contingency funding rather than reduce quantities of aircraft.

Mr. CHAPPELL. Are you saying that none of your multiyears are really affected?

General CIANCIOLO. What I am saying, those multiyears that are already under contract, that is correct. Those multiyears which are under contract which have yet to be executed, those which are in the negotiations, I do not know what the impact will be on those programs.

Mr. CHAPPELL. I am just curious to know why the Army didn't protect its multiyears?

General CIANCIOLO. Sir, the Army chose not to protect any programs other than military pay and allowances with regard to procurement. That was a decision made by the Secretary of the Army.

Mr. CHAPPELL. Suppose you just provide for the record a complete list of the items which are affected by sequestration.

General CIANCIOLO. Yes sir, I can do that.

[The information follows:]

Since the Gramm-Rudman-Hollings sequestration has only recently been implemented and Fiscal Year 1986 contract negotiations have not been completed as yet, the full impact of the sequestration cannot be assessed at this time.

## FISCAL YEAR 1986 GENERAL REDUCTIONS

Mr. CHAPPELL. Let me ask a few questions about your fiscal year 1986 general reductions.

General CIANCIOLO. If I can provide a little more insight on that. With regard to the reduction in the aircraft appropriation, we had that total reduction of $216.3 million. In FY 84 it was $12.1 million; FY 85, $31.5 million; and FY 86 $172.7 million.

As I said before, the FY 84-FY 85 reduction was based on obligated balances and the FY 86 amount was based on the total obligation authority of $3 billion $524 million.

Mr. CHAPPELL. Are you saying that you are able to take it out of unobligated balance amounts sufficient to reduce the effect of——

General CIANCIOLO. In FY 84-85 we did, yes sir. In FY 84 it was $12 million. In FY 85 it was $31 million. But I will provide that for the record.

Mr. CHAPPELL. What about general reductions Congress made in 1986? Congress made unallocated reductions in Aircraft Procurement Army totaling $152.6 million based on various inflation adjustments. The fiscal year 1987 P-1 relects the allocation of this reduction. What guidance did you receive from OSD or headquarters Army in the allocation of this reduction?

General CIANCIOLO. Sir, the reductions were based on three categories. One was a reestimate of the inflation, which was a $5 million part of that total reduction. Then we had inflation premium of $81 million, and inflation fairness adjustments of $66 million. These reductions were provided to each system on a prorated basis.

The heaviest hits were to the AH-64 program, and UH-60. At this time, with regard to the AH-64 we don't know what the impact of that is going to be on the program, since those were not the only reductions that the AH-64 program had that year.

Mr. CHAPPELL. You were given guidelines?

General CIANCIOLO. Yes sir. The guidelines we had were to apply those reductions on a prorated basis across the system.

Mr. CHAPPELL. Why was no allocation made to advanced procurement lines?

General CIANCIOLO. Sir, I will provide the answer for the record on that.

[The information follows:]

In order to minimize possible programatic impacts, the reductions were only applied to regular procurement lines which have greater funding flexibility and could better absorb the reductions.

Mr. CHAPPELL. It was the intent of Congress that these general reductions not result in any procurement quantity reductions. Was this intent fulfilled? If not, provide a list of specific reductions and an explanation for each.

General CIANCIOLO. Yes, that was fulfilled.

I might add that the intent was fulfilled as best we could and as I said, we still have some contracts that may have not been negotiated and that general reduction in regard to other reductions that some of the programs sustained, we won't know the impact of that until we negotiate those contracts.

[CLERK'S NOTE.—The Army subsequently provided the following responses on this subject.]

QUESTION. In fiscal year 1986, Congress made unallocated reductions in Aircraft Procurement, Army totalling $152.6 million based on various inflation adjustments. The fiscal year 1987 P-1 reflects the allocation of this reduction. What guidance did you receive from OSD or headquarters Army in the allocation of this reduction?

General CIANCIOLO. No guidance was received from OSD or from Army leadership concerning application of the unallocated reductions.

QUESTION. On what basis were these general reductions allocated? What guidelines or criteria were used?

General CIANCIOLO. Generally the reductions were applied on a pro rata basis across the board. There were no special criteria or guidelines used for application of the reductions.

QUESTION. It was the intent of Congress that these general reductions not result in any procurement quantity reductions. Was this intent fulfilled? If not, provide a list of specific reductions and an explanation for each.

General CIANCIOLO. The nature and extent of programatic changes in Army aviation programs resulting from inflation related reductions will not be known until Fiscal Year 1986 contract negotiations are completed. Currently there are no confirmed reports of major programatic changes due to the Committee's reduction.

[CLERK'S NOTE.—End of Army responses.]

## ALTERNATIVES TO THE LHX

Mr. CHAPPELL. General Wickham has testified that the Army is considering an alternative to the $40 billion LHX program. What specific alternatives are being considered?

General CIANCIOLO. Sir, we are looking at four sets of alternatives, one of which includes the LHX. These are normal processes with regard to analysis, so one can determine very early the best buy in terms of cost and in terms of effectiveness for the Army.

The first set of alternatives includes the current aircraft fleet which is currently in the Army, the fleet the LHX is intended to replace: OH-58, UH-1s and AH-1 helicopters.

The second alternative includes a combination of UH-60 and AH-64 aircraft with a commercial aircraft in the utility role.

The third alternative is the LHX best technical approach. That LHX for which we are pursuing conventional helicopters.

The fourth alternative is LHX with tilt rotor advanced technology rotor configuration. So those are the four alternatives we are looking at right now in our analysis effort.

Mr. **Chappell.** Is the last one the same as JVX?

General **Cianciolo.** No sir. As you recall, the LHX is very light weight aircraft. Our goal was 8,000 pounds plus or minus 500. The JVX aircraft is a 50,000 pound aircraft with the same technology.

Mr. **Chappell.** Are you not then pursuing a second tilt rotor?

General **Cianciolo.** We are examining aircraft configured in the tilt rotor configuration that is the weight class of the LHX, which is 8,000 pounds plus or minus 500 pounds. So it is a technology that is the same with regard to the rotor system in the JVX and the LHX. It is a different aircraft, yes sir. JVX is very large cargo carrying aircraft, capable of carrying 25 troops. LHX is configured to carry six with space for eight.

Mr. **Chappell.** Carry what?

General **Cianciolo.** Six soldiers with space for two more, or eight.

Mr. **Chappell.** The LHX cost and operational effectiveness analysis has been underway for more than two years. When will this study be finished?

General **Cianciolo.** Yes sir, we expect that study to be completed this year, in the summer of this year, and that study is using the alternatives that I just described to you before in the analytical effort.

Mr. **Chappell.** When will the Army make a final decision on its future helicopter program?

General **Cianciolo.** The decision dates currently scheduled for proceeding into full scale engineering development with the LHX currently is in the February-March 1987 time frame, approximately one year from now.

## AH-64 Apache Program

### AH-64 APACHE CRASH

Mr. **Chappell.** On February 20 of this year, an Apache crashed. What can you tell us about the circumstances and causes of that crash?

General **Cianciolo.** I only have preliminary information on the AH-64 crash since there is an Accident Investigation Board going on. The aircraft was involved in a training flight in Fort Rucker, Alabama, where our aviation school is, with two students. They had a caution warning light come on. That indicated one of the chip detectors, one of the gear boxes had some difficulty, some magnetic detectors collect metal. When it gets to a certain level it turns the light on. The student landed the aircraft, reported the incident, the incident being the detector light. They had no problem with the aircraft. The aircraft was then attended to by our contract maintenance personnel, the Sikorsky Aircraft Company has the contract for maintaining all the Army aircraft there. They came out with a test pilot and a ground person, they checked the aircraft over, cleaned off the detector pollution, started the aircraft up, hovered it for 20 minutes, had no difficulty, took off to return the aircraft to the maintenance area, and at very low altitude the aircraft lost power and the aircraft crashed and rolled over on its side and destroyed itself.

Mr. CHAPPELL. Killed the occupants?

General CIANCIOLO. No one was killed fortunately. One gentleman has several broken legs and another gentleman had an injured back. I mean several broken bones, including two legs and an arm. Right now, it was determined that the incident or the accident, the power loss was not caused by mechanical failure. The precise finding of the board has not been published yet, so it is not official as to what caused the incident, but it was determined and has been officially stated that it was not a mechanical failure, that it was a crew error and therefore, the aircraft were not grounded.

Mr. CHAPPELL. Was there any warranty coverage on this?

General CIANCIOLO. Sir, that aircraft belongs to the United States Army.

Mr. CHAPPELL. I mean in the maintenance contract with Sikorsky; is there any warranty which protects you?

General CIANCIOLO. I don't know the details of that contract. I will have to provide that for the record.

Mr. CHAPPELL. All right.

[The information follows:]

No. That is a cost reimbursable maintenance contract and does not contain a warranty clause in accordance with Federal Acquisition Regulation 46.705.

## FISCAL YEAR 1986 PROGRAM

Mr. CHAPPELL. In FY 86, Congress appropriated $1,137,300,000 for 144 Apaches. The Army applied a $49.5 million reduction to this line, and an additional $53,673,000 has been sequestered under Gramm-Rudman-Hollings. What impact, if any will these reductions have on the FY 86 procurement quantity?

General CIANCIOLO. Yes sir, as the $49 million was part of the general reduction that we had and as you stated, the $53 million was with regard to Gramm-Rudman. That, along with the congressional cut in the FY 86 budget of some $40 million, is going to make it very difficult as the project manager negotiates the contract for FY 86 to procure 144 aircraft.

We are not prepared at this time to say we cannot procure 144 aircraft. As you know, it is a sole source contract and we don't want to have a self-fulfilling prophecy take place with regard to the contractor as we sit down and negotiate by stating publicly that we are going to have aircraft reductions with regard to that funding reduction.

So it is going to be a knock down drag out between the negotiators on both sides, but my personal opinion is it is going to be very difficult to procure 144 aircraft.

Mr. CHAPPELL. Fiscal year 1986 authorization action required that 18 aircraft be assigned to the Army National Guard, but only if a total 144 Apaches is procured. What will be the impact of the FY 86 reductions on aircraft for the Army National Guard?

General CIANCIOLO. The Army plans to assign 18 aircraft from the fiscal year 1986 procurement to the National Guard.

Mr. Chappell. What are the milestones for negotiating the FY 86 contract?

General Cianciolo. Sir, we have already broken some of the milestones. We expected to have a proposal from the contractor—meaning McDonnell-Douglas Helicopters—in February—excuse me 26 January 1986. Right now his estimate of providing that to the Army is the 10th of March, and we expect a proposal now from Martin-Marietta which makes the target acquisition designation system, and the pilot night vision system, by the 31st of March.

So our milestones right now are to receive the proposals this month, and those proposals will be submitted in two formats, one in an annual buy for 144 aircraft with options for the remaining two years, the other a multiyear proposal which will cover the last three years of the contract—FY 86, FY 87 and FY 88. From negotiating these two proposals, we will then determine whether we will pursue an annual contract or multiyear contract.

So there is a possibility we could procure 144 aircraft because of the savings that the multiyear could provide. This will become evident in negotiations. We should start the proposal evaluations this month, and I think we plan to award the contract before August, sir.

Mr. Chappell. Mr. McDade.

Mr. McDade. Thank you, Mr. Chairman.

General, the procurement profile shown on last year's multiyear proposal for the AH-64 for FY 1986-87-88 was 144-120-102. The current profile is different. Why?

General Cianciolo. We are talking about the AH-64?

Mr. McDade. Yes. You have different numbers in your projections, a substantial difference than what you originally sent up.

General Cianciolo. The current multiyear procurement I think will include 144 aircraft in FY 86, 144 aircraft in FY 87, and 78 aircraft in FY 88.

Mr. McDade. Why? That is not what you told us.

General Cianciolo. The program was accelerated by OSD from 120 to 144, as we went through our budget deliberations for our budget submit for FY 87.

Mr. McDade. How many Apaches did the Army propose to procure in its budget submission to the OSD?

General Cianciolo. That is 675, sir. Total procurement. We proposed 120.

Mr. McDade. You proposed 120?

General Cianciolo. Yes sir, and they accelerated our program to 144, they increased——

Mr. McDade. It is increased to that level?

General Cianciolo. Yes sir.

Mr. McDade. Tell us why. Please put it in the record if you have to, we want a justification for what happened.

General Cianciolo. The increase from 120 aircraft for FY 87, yes sir.

[The information follows:]

OSD in Program Budget Directive (PBD) 674 directed the Army to increase the planned procurement for FY 1987 from 120 aircraft to 144 aircraft. That PBD used the following evaluation.

## DETAIL OF EVALUATION

| | Fiscal year 1987 | | Fiscal year 1988 | |
|---|---|---|---|---|
| | Quantity | Million | Quantity | Million |
| Service estimate | 120 | $1,094.8 | 102 | $1,037.3 |
| Alternative No. 1 | 144 | 1,258.5 | 78 | 850.0 |
| Alternative No. 2 | 144 | 1,258.5 | 78 | 850.0 |

Analysis: The service estimate for the AH-64 reduces the fiscal year 1987 program by 24 aircraft per year below the established economic procurement rate of 144 aircraft per year. By continuing this rate in fiscal year 1987 and shutting the line down earlier in fiscal year 1988, a savings of $24.1 million can be achieved. Both alternatives recommend this acceleration (FY 1987, $+163.2 million; FY 1988, $−187.3 million).

Mr. **McDade**. What is the cost of procuring 120 Apaches in FY 87?

General **Cianciolo**. Sir, I will have to provide that for the record since we are negotiating for 144.

[The information follows:]

The cost is approximately $1201.4 million using February 20 Office Secretary of Defense (OSD) indices based on the fiscal year 87-91 Army Program Objective Memorandum (POM) Program.

| | |
|---|---|
| Weapons Systems Cost | $1,085.5 |
| Spares | 115.9 |
| Procurement | 1,201.4 |

### TOTAL APACHE PROGRAM

Mr. **McDade**. The approved program for the Apache is 675 aircraft, the last of these are scheduled to be procured in FY 1988. What does the Army intend to do to the Apache production line when the 675th aircraft is delivered?

General **Cianciolo**. That production line will be shut down and that will end the production, assuming 675 is all that is procured.

Mr. **McDade**. Have you considered the readiness consequences of a cold production base for attack aircraft and found them acceptable? Tell us about that, please.

General **Cianciolo**. As you know, if I could make you aware, there is a lot of interest in the AH-64 from other countries and if, assuming that that interest takes effect, we could in fact have a warm production line through foreign military sales cases.

Mr. **McDade**. At the level of 144 a year?

General **Cianciolo**. No sir, I don't think the procurement would be of that quantity but it could be some number.

Mr. **McDade**. Zero to "X" number?

General **Cianciolo**. Zero to "X" number, yes sir.

Mr. **McDade**. If you exclude FMS, what about the cold line?

General **Cianciolo**. It would. The Army right now is in fact studying whether or not to continue procurement beyond 675, but it is just a study effort, there have been no decision made in that effort, so the procurement objective officially stated is 675.

Mr. **McDade**. Well, do you know yet how many additional ones you are considering buying? Do you have any information on that?

General Cianciolo. No, sir. All I know is we have countries that are interested in it. We have Germany interested in it.

Mr. McDade. I am talking about the Army. I am talking about you folks. You indicated you have a ongoing study as to whether you might——

General Cianciolo. We have made no decision with regard to that study yet.

Mr. McDade. Are the costs of closing the line considered in your LHX alternatives study?

General Cianciolo. I don't know why they should be, sir.

Mr. McDade. It is a program cost, isn't it, close of the line?

General Cianciolo. I don't know of any cost to the Army in closing the line. I will provide that for the record.

Mr. McDade. Check it out and provide it for the record.

General Cianciolo. Yes sir.

[The information follows:]

The Army does incur costs when a production line is closed. Some of these costs are budgeted for in a line called "Layaway of Industrial Facilities", which funds the layaway of machines and other property that belong to the government. Other costs are reflected in contractor overhead. The costs are very small compared to aircraft production costs. The LHX study does not include these costs, for the Apache or other systems, since it would be difficult to estimate the costs for a system not in production. Omitting the costs for all alternatives permits an apples to apples comparison.

Mr. McDade. What adjustment would you have made in FY 1987 advanced procurement to keep the Apache line at a sustaining rate in FY 88 and beyond?

General Cianciolo. Obviously, sir, I don't know what the exact amount would be. We could provide it for the record, but obviously I would have to provide advanced procurement in some amount to keep the line going.

Mr. McDade. Don't we know exactly what a sustaining rate would be? We are going to mark this bill up pretty soon. If there is something that is going to be considered, we need to know what kind of request you are going to come in with that would be a sustaining rate for the line. Do you have any figure?

General Cianciolo. No sir, I do not.

Mr. McDade. What is the point of having a study that comes out a year after we mark up? You said you study is going to take a year. We are going to mark this bill up pretty soon.

General Cianciolo. Sir, right now our position is to buy 675 Apaches.

Mr. McDade. Better try to get us some more definitive information and get it back to us.

General Cianciolo. All right.

Mr. McDade. Tell me what the economic and minimum sustaining rates are for Apache, and what it costs to produce Apaches, at each?

General Cianciolo. I will have to provide that for the record, sir.

Mr. McDade. Okay.

General Cianciolo. I believe the minimum sustaining rate is six aircraft per month and I believe the maximum economic rate is 12 aircraft.

Mr. **McDade**. Change that if you need to. If you need to amplify the answer, do it, because we want to know.

[**Clerk's note**.—The Army subsequently provided the following responses on this subject:]

*Question*. What adjustments have been made in fiscal year 1987 advance procurement to keep the Apache line at a sustaining rate in fiscal year 1988 and beyond?

Answer. No adjustments have to be made in fiscal year 1987 advance procurement, because the money programmed in fiscal year 1987 is to preserve the delivery schedule of the 78 aircraft in fiscal year 1988.

*Question*. What are the "economic" and "minimum sustaining rates" for Apache, and what does it cost to produce Apache's at each?

Answer. The economic sustaining rate for the Apache is 8 aircraft per month in fiscal year 1989. The funding required would be approximately:

FISCAL YEAR 1989

| | |
|---|---|
| Quantity | 96 |
| Weapons Systems Cost | 946.6 |
| Spares | 107.0 |
| Procurement | 1,053.6 |

The minimum sustaining rate for the Apache is 3.25 aircraft per month in fiscal year 1989. The funding required would be approximately:

FISCAL YEAR 1989

| | |
|---|---|
| Quantity | 39 |
| Weapons Systems Cost | 519.2 |
| Spares | 43.4 |
| Procurement | 562.6 |

*Question*. Given the imminent conclusion of the approved program (Dec. 85 SAR), what consideration has been given to maintaining production at 10 per month to "stretch out" deliveries?

Answer. Stretching out deliveries at 10 per month would require an additonal four months for the Apache program.

*Question*. When would deliveries end under such a production rate cap compared to the current program?

Answer. At 10 aircraft a month the deliveries end August 1990. The current program at 12 aircraft a month ends April 1990.

[**Clerk's note**.—End of Army responses.]

Mr. **McDade**. In view of the fact that the program is about to conclude, what consideration have you given to maintaining production at 10 per month to stretch out deliveries? Have you given any consideration to that?

General **Cianciolo**. No sir, I haven't, because we are in our sixth year of procurement for the Apache. We will get the first Apache unit in the field this year. We cannot afford to wait any longer to get those aircraft in the field and we need that capability in our Armed Forces.

Mr. **McDade**. So you are not considering any stretch-out of the current buy?

General **Cianciolo**. No sir.

**Mr. McDade.** When would deliveries end under such a production rate cap? If you stretched out would there be a substantial difference in the deliveries? When would they end?

**General Cianciolo.** I am not sure I fully understand your question. Obviously if you stretch out there is going to be a delay.

**Mr. McDade.** When would deliveries end, that is the question, when would they end if you stretched out?

**General Cianciolo.** We could put together some alternative that shows stretching out. We are right now going to 12 aircraft a month. If you are saying if we change that rate from 12 down to six——

**Mr. McDade.** Ten or——

**General Cianciolo.** When would the aircraft be delivered? I will have to provide that for the record.

**Mr. McDade.** You will also tell us the cost?

**General Cianciolo.** Yes sir. I can tell you it would have a major impact on the multiyear proposal that we expect to receive from the contractor here in five days.

**Mr. McDade.** What would be the cost and contractual implications of such a change?

**General Cianciolo.** Yes sir.

**Mr. McDade.** Will you supply a copy for the record?

**General Cianciolo.** Yes sir.

[The information follows:]

The cost implications caused going from 12 aircraft a month to 10 aircraft a month would cause an increase of approximately $50.0 million in fiscal year 1987 and fiscal year 1988. Contractual implications for such a change would be minimal. it would extend the program four months.

## CONTRACTOR COST ACCOUNTING

Question. The fiscal year 1986 authorization Act required that the Director of the Defense Contract Audit Agency certify to the Secretary that the prime contractor has implemented an effective and reliable system of internal accounting controls. Has this certification been submitted? If so, please supply a copy for the record.

**General Cianciolo.** The certificate was presented to the Army on 9 December 1985. The certificate is attached for the record.

Defense Contract Audit Agency,
Cameron Station
*Alexandria, VA, December 9, 1985.*

Memorandum for Secretary of the Army
Subject: DoD Authorization Act, 1986, Sec. 126(c)

The subject legislation placed a constraint on obligations of funds for AH-64 Helicopters until the Director, Defense Contract Audit Agency, reports to you that the contractor for such helicopters has demonstrated satisfactory action to correct specified deficiencies.

Based upon advice from our resident audit manager at McDonnell Douglas Helicopter Co. and two personal visits at the Culver City, California plant, I am satisfied that the contractor has implemented an effective and reliable system of internal accounting controls and has accumulated and made available documentation to support the final submission for settlement of indirect expense for calendar year 1979 through 1985.

Fred J. Newton,
*Acting Director.*

**Mr. McDade.** What changes has the contractor made as a result of the DCAA efforts?

General CIANCIOLO. Sir, I will have to provide that for the record.

[The information follows:]

In response, the contractor, McDonnell Douglas Helicopter Company has

Improved Compliance with control procedures and policies (e.g., timecard preparation reduced error rate from over 17% to approximately 2%).

Improved responsiveness (timing, control, content) to Defense Contract Audit Agency (DCAA) Audit procedures.

Revised Access to Records policy to provide DCAA with access to all documents requested.

Implemented all 30 DCAA recommended changes to the accounting system and related areas.

Continued support of DCAA Audit efforts for 1979–1984 Indirect Expenses.

Compiled all records necessary to support overhead claims for the years 1979–1984.

Demonstrated to the satisfaction of the Acting Director, DCAA, an adequate system of internal accounting control.

On 9 December 1985, the DCAA officially advised the Secretary of the Army that the contractor had implemented an effective and reliable system of internal accounting controls, and had accumulated and made available documentation to support settlement of expense claims.

### AH-64 MODIFICATIONS—AIRBORNE TARGET HANDOFF SYSTEM

Mr. McDADE. The budget includes $33.4 million for Apache mods. According to the justification book this is for the airborne target handoff system. Explain this program and what specifically is to be procured?

General CIANCIOLO. Yes sir, it is a system that provides digital burst of data to the Army's tactical fire control system in the artillery. It is also part of the OH-58D AHIP program and it allows burst digital communications of target locations between the OH-58D and the AH-64 Apache helicopter from either one of these two aircraft to the tactical fire direction centers of the field artillery so they can respond to call for fire.

Mr. McDADE. Is there some reason why you didn't forecast this last year?

General CIANCIOLO. Yes sir. The AHIP did not demonstrate, in a statistically significant way, its application in the Air Cav and air attack mission roles. The Department of Defense and the Congress prohibited us from fielding the OH-58D with the attack helicopter and Air Cav units.

The Apache helicopter is in those units obviously and it needs to have a way to communicate rapidly with the field artillery and so we have had to put that to the AH-64 and so the AH-64 when we first procured it, did not have that capability in it.

Mr. McDADE. Answer the rest of the questions on this subject for the record.

[CLERK'S NOTE.—Questions submitted by Mr. McDade and the answers thereto follow:]

QUESTION. What validated requirement exists for this modification (ATHS)?

General CIANCIOLO. TRADOC validated Change 12 to the AH-64 material need approved on 13 August 1985.

QUESTION. What are the development and testing milestones (for ATHS)?

General CIANCIOLO.

Urgent ECP Request—September 1985.

Preliminary ECP Submitted—January 1986.
Final ECP Submitted—May 1986.
Engineering Design/Analysis—September 1985-August 1986.
Hardware Mock-up Lab Test—April 1986-August 1986.
Aircraft Prototype Integration—June 1986-December 1986.
Prototype Flight Test—August 1986-December 1986.
Aircraft Modification/Accept Test—February 1987-June 1987.
Initial Aircraft Deliveries (20)—May 1987-July 1987.

QUESTION. What is the procurement strategy?

General CIANCIOLO. Production incorporation of ATHS will be on a noncompetitive basis to McDonnell Douglas Helicopter Company (MDHC). Noncompetitive procurement is necessary because no other contractor has the capability to incorporate ATHS into the Apache computer software system without reducing overall system reliability and the requirement required the Army to incorporate this system as rapidly as possible.

It is planned to request a two phase engineering change proposal with Phase I being incorporated into 20 helicopters to check final configuration and Phase II being incorporated into the balance of helicopters. Phase I and Phase II will both be contracted on a firm fixed price basis to equip 675 aircraft.

QUESTION. What is the procurement profile and total program cost (for ATHS)?

General CIANCIOLO. The plan is to retrofit 453 Apache's with ATHS and incorporate the remaining 222 on the production line. Procurement profile by year is as follows:

| | Fiscal year | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | |
| Ratrofit | 18 | 90 | 90 | 90 | 90 | 75 | 453 |
| Production | 0 | 144 | 78 | 0 | 0 | 0 | 222 |

Total program cost is $208.2 broken out as follows:

[In millions of dollars]

| | |
|---|---|
| SUNK & fiscal year: | |
| 1986 | 23.6 |
| 1987 | 60.8 |
| 1988 | 39.3 |
| 1989 | 26.8 |
| 1990 | 27.9 |
| 1991 | 25.3 |
| 1992 | 4.5 |
| Total | 208.2 |

[CLERK'S NOTE.—End of questions submitted by Mr. McDade.]

### OPTICAL IMPROVEMENT PROGRAM

Mr. McDADE. We were told last year that the Army would be funding an optical improvement program in FY 87. What is the status of this program, and why is it not funded for procurement as planned?

General CIANCIOLO. This is for the AH-64?

Mr. McDade. Yes.

General Cianciolo. I know we have the R&D work going on for the optical improvement. I will have to provide that for the record.

Mr. McDade. I wish you would.

[The information follows:]

Late receipt of fiscal year 1985 RDT&E funds due to reprogramming actions and three months delay in fiscal year 1986 funding caused award of Full Scale Engineering Development (FSED) contract to slip approximately fifteen months. FSED delay adversely impacted production schedule. Production contract has slipped because of the delay in acquiring R&D funds. The fiscal year 1987 Budget request does contain an OIP funding requirement for initial production; this is contained as a portion of the aircraft procurement line.

Mr. McDade. It is an R&D program. That R&D program is funded. Has it slipped? Last year we were told you were going to procure it. Has it slipped?

General Cianciolo. Not that I know of sir.

Mr. McDade. Not aware of any problems with the R&D phase?

General Cianciolo. No sir.

### AHIP Program

Mr. McDade. The budget includes $164.9 million and an additional $45.4 million in advance procurement for the Army Helicopter Improvement Program—AHIP. The budget funds 48 modifications. Last October, Deputy Secretary Taft directed that AHIP procurement be limited to 104 modifications, the number needed for the divisional field artillery aerial observer mission. The decision resulted from the operational testing which showed that the AHIP was no more effective than the OH-58C for the scout and air cavalry missions. How has the program been restructured since that decision?

General Cianciolo. Yes sir, but I would like to correct one thing. Mr. Taft did not limit the Army procurement to 104 aircraft. He stated that 104 aircraft seemed to be a reasonable estimate of the divisional needs to meet training base and divisional artillery requirements. That divisional artillery requirement is a very key word, because he also said that we could continue with procurement to meet the total field artillery requirements which include units that are above corps. So, our vital requirement in the field artillery mission mode, plus the school house training base and float aircraft, is 179 aircraft. Our program has been restructured to procure 179 aircraft.

Mr. McDade. Do you have anything written that approves 179 additional aircraft?

General Cianciolo. We have an SDDM—Secretary of Defense Decision Memorandum which does that.

Mr. McDade. Put that in the record.

[The information follows:]

[illegible] AVAILABLE

THE SECRETARY OF DEFENSE
WASHINGTON THE DISTRICT OF COLUMBIA

8 OCT 1985

MEMORANDUM FOR SECRETARY OF THE ARMY

SUBJECT: Army Helicopter Improvement Program DSARC III

On September 26 the DSARC met to consider the Army's recommendation that the OH-58D helicopter proceed from low-rate initial production to full production. A primary consideration in those deliberations was the results of the operational testing conducted in late 1984 and early 1985.

In view of the inability of the OH-58D Aeroscout to demonstrate clearly its operational advantage in supporting the Attack and Air Cavalry roles during OT II, the OH-58D will not be procured for these two roles pending further operational testing and another DSARC. However, because the available test results indicate the OH-58D Aeroscout's operational effectiveness in the Field Artillery Aerial Observer role, the Army is authorized to continue production for Field Artillery force employment. We acknowledge the 104 aircraft to be a reasonable estimate of Divisional Field Artillery needs, to include Reserve components, training base, and float aircraft. As agreed at the DSARC, these aircraft will remain committed to the Field Artillery Aerial Observation role regardless of the eventual procurement of OH-58Ds for other missions. The production rate will be held to no more than three to four aircraft per month during this period. Within 60 days, I would like you to furnish my staff the Army's plan for fielding these helicopters. You may have to adjust contract option prices to accommodate schedule changes to extend the delivery period. You should not need to reopen the entire option. No long leadtime funding for aircraft for missions other than the Field Artillery role shall be provided pending further operational testing and DSARC review. The schedule may make it necessary to procure long lead material beyond Divisional Field Artillery needs.

The Army must continue to pursue Prime Item Development Specifications (PIDS) in the areas of laser designation accuracy, the Control Data System (CDS), and the MSS/CDS Fault Detection/Location System. Follow-on evaluation should be conducted by AMSAA and TECOM. The status of improvements to these important areas will be included in the next DSARC for the OH-58D. Additionally, I support the Army's recent plan to add funds for contractor logistic support, including data collection and analysis, during initial training and development of "fixes" needed to achieve a well supported AHIP system.

In order to resolve the remaining critical operational and performance issues as expeditiously as possible, the Army will proceed immediately to plan for the conduct of a follow-on operational test. The scope of this testing should be generally similar to that originally planned for AHIP OT-II, involving Force-on-Force trials that employ a variety of mixes of attack and scout aircraft in support of an appropriately-sized ground force engaged in both offensive and defensive scenarios. The details of the scope and objectives of the test will be devised jointly by members of the OSD and Army staffs. As a minimum, the test must include attack-scout mixes in the ratios 5-1, 6-0, and 6-1. Instrumentation and other test resources should be appropriate to ensure that adequate data is collected to resolve the critical outstanding issues involving Scout detectability and survivability, the efforts of the Scout-Attack team mix on battle outcomes, and the viability and operational suitability of the command relationship between the observer and pilot.

I realize that the schedule described above is ambitious and will require a considerable effort from a variety of Army activities. Nevertheless, it is important that the operational effectiveness and suitability of the OH-58D Aeroscout in the Attack and Air Cavalry roles be clearly established prior to a production decision on these roles.

William H. Taft

William H. Taft, IV
Deputy Secretary of Defense

General CIANCIOLO. I must say to you it is a very cleverly written document and that is why I say——

Mr. McDADE. Does it say 179 aircraft?

General CIANCIOLO. It does not. It indicates a number of 104. That is almost a gratuitous comment and it says 104 aircraft is a reasonable estimate of the Army requirement for the training base and to meet divisional field artillery requirements.

Mr. McDADE. The question I put to you is whether or not you have any written approval for 179.

General CIANCIOLO. Because further in that——

Mr. McDADE. The answer to that is no?

General CIANCIOLO. The answer is, I do, in that document.

Mr. McDADE. As you interpret it you mean?

General CIANCIOLO. Yes sir.

Mr. McDADE. You don't have anything that specifically says you can get 179?

General CIANCIOLO. Yes sir, that document says it. It does not expressly say 179.

Mr. McDADE. It is not too hard to decide if a document says 179 or does not. Does the document say 179?

General CIANCIOLO. No sir, it does not, but I had played a very active role in putting that document together as a result of the DSARC III (Defense System Acquisition Review Council) review held at OSD. It was not the intent of the Secretary of Defense or the other agencies within the Department of Defense who are members of the DSARC, to limit the Army to 104 aircraft.

Mr. McDADE. Well, if that is the case, you ought to be able to get a letter when you go back over to the Pentagon today.

General CIANCIOLO. Yes sir.

Mr. McDADE. For 179.

General CIANCIOLO. That has the number 179, it must have 179?

Mr. McDADE. Yes. That is the way we usually proceed around here, on how many numbers you are going to buy or how many you are going to get. We are getting a fuzzy answer that says the letter in your opinion lets you go to 179, but it doesn't say 179.

General CIANCIOLO. The letter in my opinion, says the Army can procure the AHIP to meet the field artillery requirements. Field artillery requirements are broken into two levels of organization construction. One is a division and the other is a corps. What we were prohibited from doing was procuring any aircraft for missions beyond the field artillery mission. To field in the Air Cav and in the attack role, we must have a follow-on evaluation to be conducted at Fort Rucker—excuse me, at Hunter-Liggett next year. When we successfully complete that evaluation and report through OSD and the Director of Operational Test and Evaluation, we will be permitted to continue to procure AHIP's to our procurement objective of 578 aircraft.

Mr. McDADE. Who in the Army said you could get 179 additional?

General CIANCIOLO. I do sir, and——

Mr. McDADE. You make the decision?

General CIANCIOLO. No sir, our DCSOPS is the one who made the decision as to what the requirement was to meet the field artillery mission.

Mr. McDade. Based on your recommendation?

General Cianciolo. Sir, I don't deal with requirements, the DCSOPS did it based on the recommendations of our user, training, and school communities.

Mr. McDade. Do you have that in writing?

General Cianciolo. Yes sir, that was presented at the DSARC, the decision review.

Mr. McDade. It was?

General Cianciolo. Yes sir.

Mr. McDade. You have that in writing and can furnish that to the committee?

General Cianciolo. I believe so, yes sir.

Mr. McDade. Do it.

General Cianciolo. All right.

[The information follows:]

On September 26, 1985, The Defense Systems Acquisition Review Council met to consider the Army's recommendation that the OH-58D helicopter proceed from low-rate initial production to full production. In view of the inability of the AHIP to demonstrate clearly its operational advantage in supporting the Attack and Air Cavalry roles during OT II, the AHIP was not approved for procurement for these two roles pending further operational testing and another DSARC. However, because the available test results indicated the AHIP's operational effectiveness in the Field Artillery Aerial Observer (FAAO) role, the Army was authorized to continue production for Field Artillery force employment. The Army plan was briefed and became a matter for record.

ARMY PLAN—EXECUTE PROCUREMENT NOW TO MEET FAAO REQ

| | [illegible] | | [illegible] | | [illegible] |
|---|---|---|---|---|---|
| | [illegible] | [illegible] | [illegible] | [illegible] | |
| FAAO | 60 | 24 | 75 | N/A | 159 |
| TDA (TNG base and AMC) | 70 | N/A | N/A | N/A | [illegible] |

Form a unit at Ft Rucker on or about Jan 86, train for and execute ATK company FOE/FDTE as soon as practical NLT summer 87. Test will address:

—OH-58C VS AHIP in ATK and CAV Role

—3/5 mix in ATK CO and 5/3 MIX in CAV

Report findings to OSD prior to execution of "Lot 5" for full scale production procurement objective of 578.

Mr. McDade. The restriction on procurement applies until the completion of the additional testing called follow-on evaluation and a second ASARC III-DSARC III. What are the milestones for these activities?

General Cianciolo. That is the activity I was referring to just a minute ago. That evaluation is required to demonstrate the aircraft's effectiveness in the two other mission roles, that of attack and Air Cav. We are right now in the minus 300 and about 60 days before we begin the test follow-on evaluation. The evalution will be done next year at Hunter-Liggett. We expect to have the results completed and a decision review in the August-September 1987 time frame.

Mr. McDade. Is the restructuring going to add to the total program cost? If so, how much?

General Cianciolo. I have to provide that for the record.

[The information follows:]

There is a near-term impact of approximately $49 million in fiscal year 86 execution. Peculiar ground support equipment increased due to the greater geographical dispersion of the Field Artillery Aerial Observer or FAAO units versus the attack units originally planned. Additionally, deliveries were restricted so as not to exceed four a month, the benefits of the learning curve are lost resulting in unit costs increases. The expected long-term impact to the total program is estimated to be $134 million dollars and a program stretch out of 16 months.

**Mr. McDade.** Before the program was restructured last year, the total development/acquisition cost for 578 modifications was $2.2 billion, for a program acquisition unit cost of $3.8 million, accordinag to the budget justifications. What will be the corresponding unit costs for the restructured program if 179 are procured and if 578 are procured? What is the difference if you do those two numbers?

**General Cianciolo.** Sir, right now, the procurement unit cost for the AHIP for the 578 program under the profile we currently have in escalated dollars is $4.7 million. I will have to provide answers for the record to complete the answer to your question.

**Mr. McDade.** Okay.

[The information follows:]

Before I answer the question, I would like to straighten the record concerning previously reported program costs. Last years SAR, before the restructure for AHIP, reported a total development and acquisition cost for 578 modifications and five prototypes to be $2.66 billion, for a program acquisition unit cost of $4.58 million, all in escalated dollars. Now then, the current program acquisition unit cost for 578 AHIP's is $5.63 million. The program acquisition unit cost for 179 AHIP's would be $6.95 million in escalated dollars. Initial spares are included in the values indicated.

**Mr. McDade.** It appears that Mr. Taft also directed that deliveries be held to four per month until the completion of the follow-on evaluation.

**General Cianciolo.** That's correct.

**Mr. McDade.** Provide for the record the original monthly delivery schedule for the first five years of procurement and the schedule of the restructured program.

**General Cianciolo.** I apologize.

**Mr. McDade.** I told you to provide for the record the original monthly delivery schedule for the first five years of procurement and the schedule for the restructured program.

**General Cianciolo.** Yes sir.

**Mr. McDade.** No problem?

**General Cianciolo.** No problem.

[The information follows:]

Those deliveries are shown here:

AHIP DELIVERIES—ORIGINAL SCHEDULE

| | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|---|
| October | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| November | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| December | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| January | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| February | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| March | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| April | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| May | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

AHIP DELIVERIES—ORIGINAL SCHEDULE—Continued

| | Fiscal year | | | | |
|---|---|---|---|---|---|
| | 1986 | 1987 | 1988 | 1989 | 1990 |
| June | [1] 3 | 6 | 5 | 7 | 10 |
| July | 4 | 6 | 5 | 8 | 10 |
| August | 5 | 6 | 5 | 8 | 10 |
| September | 5 | 6 | 5 | 9 | 10 |

[1] Fiscal year 1984 16.
[2] Fiscal year 1985 44.
[3] Fiscal year 1986 56.
[4] Fiscal year 1987 60.
[5] Fiscal year 1988 92.

AHIP DELIVERIES—REVISED SCHEDULE

| | Fiscal year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
| October | | 4 | 3 | 4 | 4 | 8 | 10 | 10 | [9] 6 |
| November | | 4 | 3 | 4 | 4 | 8 | 10 | 10 | |
| December | 2 | 4 | 3 | 4 | 4 | 8 | 10 | 10 | |
| January | 2 | 4 | 3 | 4 | [5] 4 | [6] 8 | [7] 10 | [8] 10 | |
| February | 2 | 4 | 3 | 4 | 5 | 9 | 10 | 10 | |
| March | 2 | 4 | 4 | 4 | 5 | 9 | 10 | 10 | |
| April | 2 | 4 | 4 | 4 | 6 | 9 | 10 | 10 | |
| May | 3 | [2] 4 | [3] 4 | [4] 4 | 6 | 9 | 10 | 10 | |
| June | [1] 3 | 3 | 4 | 4 | 6 | 10 | 10 | 10 | |
| July | 4 | 3 | 4 | 4 | 6 | 10 | 10 | 10 | |
| August | 4 | 3 | 4 | 4 | 7 | 10 | 10 | 8 | |
| September | 4 | 3 | 4 | 4 | 8 | 10 | 10 | 8 | |

[1] Fiscal year 1984 18.
[2] Fiscal year 1985 33.
[3] Fiscal year 1986 39.
[4] Fiscal year 1987 38.
[5] Fiscal year 1988 [illegible].
[6] Fiscal year 1989 81.
[7] Fiscal year 1990 119.
[8] Fiscal year 1991 120.
[9] Fiscal year 1992 86.

Mr. McDADE. Production deliveries of AHIP began late last year. What production problems have been encountered to date by the prime contractor and his major vendors, and what is your prognosis for fixing these problems? How do you figure you are going to fix these problems.

General CIANCIOLO. Sir, aircraft have been delivered on schedule, but it is a very tight schedule. The latest delivery is a little behind because it was decided to do a physical teardown of the aircraft to observe specification compliance. Although it was ready to delivery at the time of the teardown, the process caused a late Army acceptance, about four days.

There have been some minor delays in getting the production deliveries. Right now they seem to be under control. Primarily the delays were in the mission equipment package of the mass mounted sight, but we seem to be doing fine with regard to that.

Mr. McDADE. So you don't have any major problems?

General CIANCIOLO. Not right now.

Mr. McDADE. The current profile calls for procurement of 39 AHIPs in FY 86, 48 in '87, and 81 in '89. What accounts for this erratic profile?

General CIANCIOLO. That was our attempt to meet the explicitly stated four aircraft per month delivery schedule that OSD placed on us and to adjust the funded delivery period so that they could in fact meet that.

Mr. McDADE. That is the sole reason for it?

General CIANCIOLO. Yes sir.

Mr. McDADE. What would be the funding requirements for advance and regular procurement in fiscal years 1987 and 1988 if 40 aircraft were funded each year?

General CIANCIOLO. I will have to provide that for the record.

[The information follows:]

Advance procurement in fiscal year 1987 and fiscal year 1988 would be $56.1 and $171.1 million, respectively. The fiscal year 1988 value is for 81 AHIP's in fiscal year 1989. Regular procurement in fiscal year 1987 and fiscal year 1988 would be $147.3 million plus $41.5 million for spares and $131.2 million plus $45.4 million for spares, respectively.

Mr. McDADE. The first two years of procurement were under fixed price contract. Based on your current estimate, how will actual costs in these two years compare to the contract?

General CIANCIOLO. Sir, I will provide that for the record, too.

[The information follows:]

The first two years of production were under Firm Fixed Price contracts and negotiated under not-to-exceed ceilings established during Full Scale Engineering Development. In that environment the contractor does not submit Cost Performance Reports. Our opportunity to review and audit actual costs will occur during analysis of the contractor's cost proposals for the fiscal year 1986 Lot 3 buy which is coming up.

Mr. McDADE. What are the milestones for completing the FY 86 contract?

General CIANCIOLO. I think we expect award to contractor in the fourth quarter of FY 86. We can give you the exact date.

Mr. McDADE. Better do that please, to complete the record.

[The information follows:]

That schedule is shown here:

*Fiscal year 1986 Contract Schedule*

| | |
|---|---|
| Receive proposal | March 1986 |
| Complete should cost | July 1986 |
| Complete negotiations | August 1986 |
| Award | August 1986 |

Mr. McDADE. What efforts are being made in fiscal years '86 and '87 to squeeze down costs, break out components, and increase competition in AHIP?

General CIANCIOLO. Sir, AHIP program has had a good record of controlling costs. It was cited by OSD as a good example for cost control when we negotiated the lot one and two contracts. We received not to exceed hardware prices under competition for those contracts. However, we have only built four of these aircraft and the production run is continuing now and—

Mr. McDADE. Aren't you paying $4 million more for modifications on these?

General CIANCIOLO. Yes sir, in escalated dollars, yes sir, $4.6 million.

Mr. McDADE. You know, when you are talking about the cost being held down you are paying $4 million more in meds and we are trying to figure out how you could hold the cost down. The modification program is significant here.

General CIANCIOLO. Yes sir, it certainly is.

Mr. McDADE. What do you do to keep costs down instead of going up? What are you doing to hold the line on them?

General CIANCIOLO. The increase in the cost is for escalation purposes. The costs that we negotiated on the first two contracts were based on competition. They were firm fixed priced options for those aircraft.

Mr. McDADE. You mentioned inflation. Inflation was built into the contract, wasn't it?

General CIANCIOLO. I don't know the answer. I don't know if there is an escalation or EPA clause in the contract for inflation. We know some contracts that do and some that don't.

Mr. McDADE. You ought to be able to do more things to pull that cost down, don't you agree?

General CIANCIOLO. Yes sir.

Mr. McDADE. What I want to know is what you are going to do to accomplish that.

General CIANCIOLO. We will provide something for the record.

[The information follows:]

The contractor's cost proposals for the fiscal year 1986 buy will be analyzed for comparison against actual costs incurred by the prime and major subs on Lots 1 and 2. The Army intends to squeeze costs through hard nosed negotiations, value engineering and limited changes. In the fiscal year 1987 buy, the major subsystem cost drivers—the mast mounted sight and control display system will be broken out and procured directly from McDonnel Douglas and Sperry. Also spares are currently being procured direct from the source. Competition at the component level has been initiated for the laser range finder and the TV tube. In addition, second sources are being qualified for airframe components such as the battery, fuel cell and starter generator. Additional second sources will continue to be emphasized by the PM as qualification permits.

Mr. McDADE. Thank you, Mr. Chairman.

## AHIP TESTING

Mr. MURTHA [presiding]. Gentlemen, I think the gentleman from Pennsylvania has an important point. We are struggling, trying to support the President's budget. As a matter of fact, I was talking to the President the other day in the context of his speech and I told him there is no way that we are going to be able to sustain his military buildup without a tax increase, and there was no way we can justify more money for a program, as I understand it, that is a high priority for the Army, but it looks like to me that you are trying to bypass the process, for instance, by you drafting a letter for the Secretary which isn't clear and then you have a cost problem, as I understand it in this AHIP program. The modified version in the first test didn't come out any better than the old version.

General CIANCIOLO. Sir, I said from a statistically significantly point of view, that is correct. Why it didn't come out better defies common sense. The OH-58D, to give you a couple of examples, the OH-58D is equipped with a night sight device, a laser designator, and a four bladed rotor system. It has upgraded avionics, has ballistically tolerant dynamic components, and a larger engine that can claim a vertical rate of climb that is significant over what the OH-58C can do. It can fly at night, ———. OH-58C can't find any further than you can see with your naked eye. It does not have operational performance compared to the OH-58D. We just had a poorly constructed test.

Mr. MURTHA. Who set that test up?

General CIANCIOLO. We did, sir.

Mr. MURTHA. You see our problem. It is like the toilet seat problem, when you have this kind of problem it gets in the newspapers, then we have to try to justify these kinds of expenditures. The Congress just reflects the mood of the public, and you know the public no longer supports spending money for defense, they think we have reached a plateau. They want a strong defense but they don't want the increase, so if we have built into a test that you set up, which shows that it is statistically or however you interpret it, that it is not any better, and in addition that you have increased cost escalation above what you estimate. You have letters sent up that are kind of not clear, you see the problems that we run into trying to justify this on the floor of the House.

It is one thing in a closed meeting, it is one thing for you to give us an opinion when this kind of problem gets out and it always does, no matter how you try to work around it, it gets into the newspapers because somebody leaks it to the newspaper. Then we have that much more trouble justifying a progrm which is apparently a very high priority with the Army.

General CIANCIOLO. Yes sir, you are correct, but I want to assure you and this committee that the OH-58D, that program for which you have funded, has provided an aircraft of significant performance improvements over what is currently out there in the United States Army fleet, the OH-58C.

Mr. MURTHA. So you are saying that apparently then either the personnel weren't adequately trained to handle the test or the test wasn't structured in a way that it didn't measure accurately the increased effectiveness of the aircraft, is that what you are saying?

General CIANCIOLO. That is what I am saying, sir. One of the major problems we had was with regard to the measures of effectiveness of OH-58D. We selected a crew member to fly with the pilot in the OH-58D whose skills were mechanical in nature. We have since changed that as a result of the test data received that says we made an incorrect choice. We should have picked one, a person, an individual trained in intelligence and operational matters and has other aptitudes. We are doing that now and we expect to see a significant change in the performance of the aircraft in the follow-up evaluation.

## AIRCRAFT SPARES

Mr. MURTHA. Let's talk about spares. The budget includes $710.5 million for aircraft spares and repair parts. Last year's budget projected a fiscal year '87 request of $1.2 billion. In FY 86, the budget was $949.7 million while the projection was $719 million. Why has the Army done such a poor job forecasting its spares and repair parts requirements?

General CIANCIOLO. Sir, the spares program is, as I said, made up of three components, initial spares, replenishment spares, and war reserves. We have attempted to procure with every new aircraft procurement initial spares and we have forecast and funded for that.

With regard to replenishment spares, we have based our replenishment spare requirement on what our annual flying hour program is.

With regard to war reserves, we have tried to get to a goal of at least a —— or a maximum of —— of war reserves. That is the area for which we have been unable to completely satisfy our goal and that is the area which the cuts or reductions in aircraft spares primarily have come from. We are now at —— of supply in war reserves. We hope to increase that by another four days of supply with our FY 87 request.

Mr. MURTHA. How was it in previous years, were you over or under the previous year in your estimate?

General CIANCIOLO. With regard to what, war reserves or——

Mr. MURTHA. Your total budget?

General CIANCIOLO. Our total budget was reduced last year I believe. When all the congressional action was done with the budget, we wound up with $893 million in spares.

Mr. MURTHA. Well, in the fiscal year 1985 budget, you said you were going for $719 million for spares in FY 1986.

General CIANCIOLO. That is correct.

Mr. MURTHA. So this is the opposite of what we had in this case. What we are asking is, why are you having such a problem forecasting, what is it? How do you have both extremes here?

General CIANCIOLO. As I said, the war reserves account we try to build the war reserves to get to a —— supply. As we go through our affordability actions within the Army, if there are sufficient funds to permit us to continue to increase our days of supply, we do that. However, you noticed that we have taken a significant reduction in '87 from what our '87 column of the '86 budget said that we wanted—$800 million reduction in the aircraft procurement account and aircraft spares payed a significant dollar value in that reduction.

Mr. MURTHA. The opposite happened last year. Why is that?

General CIANCIOLO. I will have to provide that for the record. The obvious answer that is that we were able to afford to procure more war reserves spare parts in that year than we were in this year, but we will provide that answer for the record.

Mr. MURTHA. In other words, as you got down towards the end of the year, your priorities change with the amount of money that was available, is that what happened?

General CIANCIOLO. Well, priorities don't change, there is only so much money.

Mr. MURTHA. Priorities change with the amount of money available?

General CIANCIOLO. Yes sir.

Mr. MURTHA. You have more money available, you can add more money to it. If you have less money available obviously something has to be cut?

General CIANCIOLO. Yes sir.

[Additional information follows:]

The fluctuation in the forecast for spares from one year to another is not related to changes in requirements. The decrease in the fiscal year 1987 line between the fiscal year 1986 and fiscal year 1987 President's Budget is primarily attributed to an Army decision that the previously planned sustainability level for war reserves spares was not affordable (-$263 million). Changes in customer demands for peacetime spares accounted for a reduction of $16 million. A realignment of items from the Army Stock Fund to the procurement spares line was reversed (-$52.0 million). A reduction for anticipated savings from spares procurement initiatives was made by the Army (-$22 million). In addition to the above reductions Office of the Secretary of Defense (OSD) directed budget reductions to the spares funding primarily for the Army's inability to obligate the prior year's programs (-$96 million). The application of revised inflation factors also reduced the spares line (-$38 million). The biggest increase in the fiscal year 1986 spares line between the fiscal year 1985 and fiscal year 1986 President's Budget is attributed to a plus-up in war reserves spares funding of $162 million by OSD and the Army. There was also an increase of $71 million to peacetime spares to support the Army's initiative of ramping-up the flying hour program.

Mr. MURTHA. What was the impact of the $100 milion reduction made in FY 86 authorization/appropriation process?

General CIANCIOLO. Sir, that was spread out across quite a few programs. I think I have five pages of what those reductions did. I could provide that data for the record rather than trying to cover each one of the programs because it not only involved $100 million reduction but it involved other things too.

[Additional information follows:]

The $100 million reduction to the fiscal year 1986 budget was taken in the war reserves spares line. This reduction decreases the Army's ability to support combat surge requirements and delays attainment of OSD and Army objectives.

Mr. MURTHA. How much did the Army include for spares in its FY 87 budget submittal to the Office of the Secretary of Defense?

General CIANCIOLO. I will have to provide that. I don't know the answer to that question.

[The information follows:]

The Army requested $772.1 million in the fiscal year 1987 budget submitted to the Office of the Secretary of Defense.

Mr. MURTHA. How much of the reduction is attributable to changed procedures for inflation calculations?

General CIANCIOLO. Well, the exact number I don't know, but obviously there are reductions because we no longer have unpriced POAs, we have more competition in procurement of spares, and—I believe I have the answer sir, I have to find it. I will provide it for the record.

Mr. MURTHA. That is something that could be very helpful to us because if there is a substantial amount of money that has been saved by procurement reforms, that is something we ought to be able to talk about and something that would be helpful to this committee in trying to justify the defense expenditures. If you could find it in a hurry or make sure that we get a chance to see it as we move through this process.

General CIANCIOLO. Sir, I can't find it right now. I will provide it.

[The information follows:]

Actual savings/cost avoidances attributed to spares procurement reforms will not be realized until execution of the fiscal year 1987 budget. However, the Army reduced the fiscal year 1987 budget requirements by $22 million prior to submission to Office of the Secretary of Defense in anticipation of savings resulting from the spare parts procurement initiatives.

Mr. MURTHA. How much of the reduction is attributable to changes of procedures for inflation calculations?

General CIANCIOLO. In the spares account?

Mr. MURTHA. Right, spares account.

General CIANCIOLO. $37.7 million is the reduction with regard to recalculation of inflation and with regard to your other question, with regard to the management initiative to reduce costs, $23.9 million was reduced, saved, through those measures in the spares accounts.

Mr. MURTHA. What is the impact of reduction on flying hours and/or war reserves of the remainder of the reduction?

General CIANCIOLO. I do not have war reserves as such, sir. I only have the initial spares and replenishment spares with the total for the entire activity. With regard to the recalculation of the inflation, it was $37.7 million and economic $23.9 million. I will have to provide the war reserves.

[The information follows:]

The greatest impact of the remainder of the reduction is realized in the war reserves spares account. The significant net reduction of $263 million to war reserves impact on the Army's ability to support combat surge requirements and further delays attainment of Office of the Secretary of Defense and Army objectives in terms of days of supply. The impact of the reduction on the flying hour program is expected to be minimal.

Mr. MURTHA. What would the Army consider to be fully funded aircraft spares budget?

General CIANCIOLO. It would be budget that provided for the initial spares for every aircraft we are procuring, for the replenishment spares to support the annual flying hour program, and of course, the monies to provide for a full ——— war reserve.

[The information follows:]

The Army considers our peacetime spares requirements to be fully funded in the fiscal year 1987 President's Budget. War reserve requirements are funded consistent with Army's priorities and affordability constraints.

Mr. MURTHA. Give us a figure, because I stopped at several bases on the way over and back from the Philippines. I saw they were already reducing flying hours. I just received a long letter from the Air Force, where they said they had no accidents or had substantially reduced accident rate, and it was due to better spare parts, better flying hours, and all this put together. Now, the first thing the Air Force reduced by three percent was the amount of flying hours. This committee has gone through this thing over and over again.

As a matter of fact, this subcommittee itself put in billions of dollars over the years to make sure the spare parts were something we had. We insisted on the spare parts packages with procurement of airplanes and so forth. This committee has tried to be in the forefront of providing the amount of spares needed for all the Services because we understand the need for them.

So, if you will provide a figure so we can perhaps judge where we are and look back and see where we were just a few years ago.

General CIANCIOLO. Sir, I just want to assure you that our flying hours program is fully funded, and the difference is in the war reserves level of stockage.

Mr. MURTHA. Have you got unobligated balances in the spares account?

General CIANCIOLO. Not right now, sir. We did have and reduced the spare requirements because of some prior large unobligated balances. I think in FY 84 we were 99 percent obligated and in FY 85 we were about 77 percent obligated.

Mr. MURTHA. How much was this due to your reduction, what would it have been if it hadn't been for the reduction?

General CIANCIOLO. If we had not reduced the——

Mr. MURTHA. Unobligated balances.

General CIANCIOLO. I will have to give a——

Mr. MURTHA. You reduced the purchase, what do you reduce in order to reduce the unobligated balances?

General CIANCIOLO. We reduced the FY 87 request so that it is not included in the $710 million of spares by an amount based on the aircraft procurement account to obligate the dollars provided them in spares lines.

Mr. MURTHA. This unobligated balance is a real stickler for the chairman of the full committee. He talks about it all the time and shows charts about the increase in unobligated balances throughout the whole Department of Defense, how they have been increased so substantially. It really is an astounding increase.

What you are saying is you reduced the unobligated balances by just cutting back on procurement and it caught up with you. Is that what you are saying?

General CIANCIOLO. Yes sir, that is what I am saying.

Mr. MURTHA. Mr. McDade.

## AIR-TO-AIR STINGER

Mr. McDADE. Thank you, Mr. Chairman.

Let's talk about the Stinger. The budget includes $28.8 million for air to air Stinger modifications. This is the first procurement of this modification, and the first time that the Army will be buying dedicated air to air missile capability for its helicopter fleet. What are the details of this program?

General CIANCIOLO. That money is not to buy missiles. Those monies are to buy Stinger launchers for our OH-58 fleet of aircraft, so that the missile can be air launched. The Stinger launcher, the sighting system, the rails, fire and interface electronics are included in those dollars. The request will procure 74 sets of air to air Stinger systems.

Mr. McDADE. They are Stinger kits?

General Cianciolo. Yes sir, the launcher is attached to the aircraft and the fire control system allows the pilot to fire the missile while flying the aircraft. It does not buy missiles.

Mr. McDade. General, the committee has been told that you are considering other missiles, that the Army was evaluating the French Mistral air defense system as an alternative to the Stinger for air to air combat. Why is the Army buying aircraft mods for Stinger when it might in fact use another missile?

General Cianciolo. Right now we are not considering any other missile in the air to air role.

Mr. McDade. We have a letter from the Office of the Secretary.

General Cianciolo. We are looking at participating in a test with the French missile, but we have not made a decision to procure that missile.

Mr. McDade. The paper that we have in front of us says that you are thinking of it as an alternative to the Stinger missile, the French system. That is what the OSD paper tells us.

General Cianciolo. We believe the paper says we are investigating, doing a test to see whether we should do that.

Mr. McDade. Let me read to you what the OSD says:

> Evaluate the missile for use on fixed wing and helicopter mounted adaptation for air to air combat role as an alternative to the use of the Stinger missile.

That is pretty clear. It says you are looking at an alternative to the Stinger and you are saying you are not.

General Cianciolo. I am saying that the money in the FY 87 budget request for the $28.8 million is to buy launchers for the Stinger missile on OH-58 aircraft.

Mr. McDade. General, why look at alternatives if you are putting the rails and configuring the airplane for the Stinger? What are we doing looking at an alternative?

General Cianciolo. Because, sir, we have other aircraft that we would want to apply air to air missile to. We have not begun that effort yet with those other aircraft.

Mr. Murtha. What is the cost of the air to air Stinger per unit? Give me a comparison between the French and the one you are looking at.

General Cianciolo. I will have to provide that for the record since I don't know what the French missile cost is.

Mr. Murtha. It seems to me, isn't the Stinger $100,000 a missile or something like that?

General Cianciolo. No sir. The Stinger missile procurement unit cost in FY 87 dollars is $74,000.

Mr. Murtha. It is $74,000? Compare the French with that.

General Cianciolo. Yes sir.

[The information follows:]

> The Stinger missile procurement unit cost in 1987 dollars is $74,000. The French firm (MATRA) was requested to provide a cost estimate for their missile but has not responded as of yet.

Mr. McDade. General, air to air is new for the Army, the air to air mission, is that right? How can you give assurances to the committee that it is not going to detract from the main purpose of the chopper, such as tank killing, observation, transport, et cetera?

General CIANCIOLO. Sir, the aircraft we are putting the missile on are Scout aircraft. It is purely a defensive mechanism since we don't have any other means on board the aircraft to protect it from the air to air threat.

Mr. McDADE. So you are saying you are not going to put the Stinger on all of these, just on the forward observers?

General CIANCIOLO. Our intent right now with the FY 87 procurement dollars are for the Scout aircraft. With regard to our attack aircraft, AH-64 and AH-1S our intent is to equip those aircraft with such a capability too.

Mr. McDADE. All of them?

General CIANCIOLO. All 675 AH-64's and 625 of the AH-1S Fleet.

Mr. McDADE. You don't think it is going to detract from say, the tank killing role of the Apache?

General CIANCIOLO. No sir, I don't, at least not in the AH-64 role. The Cobra may have some difficulty with regard to payload capability, since it is limited in payload.

Mr. McDADE. What is the payload?

General CIANCIOLO. It has a gross weight of 10,000 pounds, and of course, if you add air to air Stinger missiles to its payload requirement you have to reduce something.

Mr. McDADE. What is the weight of the air to air missile system?

General CIANCIOLO. 170 pounds, sir.

Mr. McDADE. I interrupted you. You were saying if you cut out Cobra you have to make certain other adjustments——

General CIANCIOLO. Yes sir, since you are adding weight you have to trade some weight off since you have a design limit on the total aircraft weight.

Mr. McDADE. And the options would be to——

General CIANCIOLO. There are several options. One would be to reduce the amount of fuel that you carry, reduce the amount of cannon ammunition or reduce the number of antitank missiles that you carry on board. I would think we would not want to compromise the primary mission, which is the tank killing mission. So we would look for other alternatives. That has to be done on a case by case basis.

Mr. McDADE. Last year, General, you projected a fiscal year 1987 request of $39.8 million. What accounts for the $11 million reduction in your actual budget?

General CIANCIOLO. We are still talking about the air to air Stinger?

Mr. McDADE. Yes, the $11 million reduction from the budget that was projected last year.

General CIANCIOLO. Yes, $1.8 million of that resulted from revised inflation indices and the $9.2 million there was moved by OSD to FY 90.

Mr. McDADE. So you are going to be able to procure fewer of them?

General CIANCIOLO. Sir, this action did not reduce the production quantities, it only aligned the required funding with the anticipated contract award date.

Mr. McDADE. What is the total cost of the program excluding the cost of the missiles?

General **Cianciolo**. We are forecasting the $162 million for 720 launchers for the OH-58. The total cost of equipping 2,545 helicopters with 3,798 air-to-air systems is estimated in this year dollars to be $829.7 million which includes $56.7 million RDTE and $773.0 million procurement.

Mr. **McDade**. How do you divide 720 launchers, how are doing that?

General **Cianciolo**. You mean by year?

Mr. **McDade**. No, no, the various types of machines that you are thinking of putting them on?

General **Cianciolo**. These 720 are intended for observation aircraft, OH-58 Scout aircraft.

Mr. **McDade**. How many Stinger missiles are going to be required for the program?

General **Cianciolo**. I will have to provide that for the record.

Mr. **McDade**. Provide the cost also, will you?

General **Cianciolo**. Yes sir. Of the Stinger missiles?

Mr. **McDade**. Yes.

[The information follows:]

It is estimated that 19,206 missiles will be required to support the air-to-air Stinger requirement. The total flyaway unit cost for the Stinger missile is estimated to be $43,151 in 1987 constant dollars and $42,509 in fiscal year 1988 constant dollars.

Mr. **McDade**. Has the overall Stinger procurement quantity been increased as a result of this program?

General **Cianciolo**. No sir. In fact the Stinger procurement has been decreased because of the DIVAD system being terminated. We had them on every DIVAD system.

Mr. **McDade**. DIVAD was going to have a Stinger?

General **Cianciolo**. Yes sir.

Mr. **McDade**. So you are planning on just scrapping that now. You are going to put them on the aircraft we are talking about?

General **Cianciolo**. Yes.

Mr. **McDade**. Rather than cancel the weapon?

General **Cianciolo**. We did reduce the missile procurement account by some hundreds of millions of dollars to reflect a reduction of Stinger requirement because DIVAD is——

Mr. **McDade**. Is it solely DIVAD? How can we be sure the soldier in the field is not going to lack a Stinger? We have a decrease in the number, how can you assure this committee that is not going to translate to a reduction in the field?

General **Cianciolo**. If I understand your question correctly, because of the reduction of the Stinger by that——

Mr. **McDade**. There is a reduction in the Stinger base?

General **Cianciolo**. Yes sir.

Mr. **McDade**. You are going to take part of this diminished buy and put them on aircraft, right?

General **Cianciolo**. We are going to take Stinger missiles and put them on aircraft. The aircraft missiles were already provided independent of the DIVAD reduction.

Mr. **McDade**. You are simply using the amount you planned to procure for the DIVAD, and put them on helicopters, is that right?

General **Cianciolo**. No sir. I didn't say that. I said that was an independent action.

Mr. McDade. What is that?

General Cianciolo. It was an independent action. Stinger reduction for DIVAD was independent of the aircraft requirement.

Mr. McDade. But you have cut the total number you are asking for?

General Cianciolo. Yes sir.

Mr. McDade. If it was unrelated, it sounds to us like it will result in a cut for a soldier in the field. You are not buying more missiles, correct?

General Cianciolo. I am not buying the missiles that we had programmed to go on DIVAD because I no longer have DIVAD.

Mr. McDade. Are they going to come out of somebody's hide because you are not requesting more?

General Cianciolo. No sir, we had funds in the missile procurement account to buy Stinger missiles to go on DIVAD. They were for DIVAD. We are not going to buy those misiles now. The reason we are not going to buy them is because we no longer have a DIVAD. Maybe I am not communicating.

Mr. Willson. General, the Army is arming its helicopters with Stinger missiles?

General Cianciolo. Right.

Mr. Willson. The Army has decreased the total number of Stinger missiles that it is going to buy?

General Cianciolo. Right.

Mr. Willson. That would indicate, it would seem to me, that the Stinger missiles available to the soldier for the surface to air role will be decreased because those are going on airplanes?

General Cianciolo. You are right because we have decreased the number of Stinger missiles to be procured, the number available for soldiers is decreased, that is correct.

Mr. Willson. Does that concern you?

General Cianciolo. No, because we have provided for the soldier the Man Pad systems of which we will have some 3,000. We have already procured enough Stinger missiles to equip 1,030 Man Pad Stinger systems in the field to date. We plan to get to 3,000 plus Man Pad systems in the United States Army with the Stinger missiles we are going to procure. We are not short changing those Man Pad systems. Those Man Pad systems consist of two soldiers and six Stinger missiles on each one of those systems. So we have not shorted them that I am aware of.

Excuse me. If I could get some more clarification. We planned to buy 2,950 Stinger missiles for the Sergeant York. We have reduced those from the program and that is a $261 million reduction in the Stinger line.

I don't know what else to say about it other than we removed those since they were to be procured for Sergeant York.

Mr. McDade. You are talking about alternatives to the DIVAD aren't you?

General Cianciolo. Yes sir.

Mr. McDade. Is Stinger involved in any of that planning?

General Cianciolo. The only Stingers that are involved in that planning is the reconfiguration of the Man Pad system that I just described to you, that included two men and their Stinger missiles. They carry those, they have a vehicle, Jeep or something that they carry those missiles on to a configuration where we have the Stinger missiles mounted on a pedestal and on the vehicle. That would be the change in the Man Pad system to what we call pedestal mounted Stinger. It increased the mobility and rate of fire which the soldier can employ in the system.

Mr. McDADE. We will be looking closely at this whole program.

General CIANCIOLO. Yes sir.

Mr. McDADE. For which specific aircraft types does the Army have a validated requirement for this program? Do you have to validate requirements for additional aircraft types? What are the specific aircraft you have a validated program requirement for?

General CIANCIOLO. With regard to air to air Stinger?

Mr. McDADE. Yes.

General CIANCIOLO. The Army has a validated requirement for equipping 720 Scout aircraft, with the air-to-air Stinger system. Required Operational Capability changes will reflect the additional aircraft types as the AH-64, AH-1S, and UH-60.

Mr. McDADE. Are they validated requirements?

General CIANCIOLO. In terms of, when you say validated are you speaking specifically about a requirement document?

Mr. McDADE. Exactly.

General CIANCIOLO. From the——

Mr. McDADE. Yes.

General CIANCIOLO. The requirement on the aircraft should complete Army staffing and be approved in approximately two weeks.

Mr. McDADE. You have a draft?

General CIANCIOLO. Yes sir.

Mr. McDADE. They are not validated requirements if it is just a draft, are they?

General CIANCIOLO. In terms of the documentation, that is probably correct if we call it a draft. In terms of validated need for the system it was the highest priority deficiency in the army aviator mission area analysis. It was validated again in the forward area air defense working group efforts for the forward air defense system, because from that requirement's generation process came the need to accelerate the air to air Stinger program for our Scout and attack aircraft.

Mr. McDADE. What are the testing and other program milestones for each aircraft type?

[The information follows:]

The integration efforts for the AH-64, AH-1 and UH-60 will require approximately 15 months to accomplish from contract award. The contracts for all three aircraft are scheduled to be awarded in September 1986. This concurrent integration effort will result in Government acceptance testing during the 1st quarter of FY 1988. Since the air-to-air launcher is currently being developed as a generic launcher, there will be no requirement to repeat the DT/OT Tests.

[CLERK'S NOTE.—The Army was requested to provide a more responsive and specific answer but was unable to do so in time to be printed.]

Mr. McDADE. Are the fiscal year 1986 and 1987 development programs fully funded? If not, please explain.

General CIANCIOLO. No sir.

Mr. McDADE. Why not?

General **Cianciolo**. After the demise of the Sergeant York, the forward air area defense working group that I mentioned a second ago, showed that we needed to accelerate the introduction of the air to air Stinger on our attack aircraft and Black Hawk helicopters and so we moved RDTE funds that we had intended to submit as part of the FY [illegible] budget, for air to air Stinger on those aircraft. We moved those $28.8 million to the FY 86 program and made it part of our $176 million R&D request to the Congress for residual funds.

The Army was only provided $41 million of those $176 million requested, so we are attempting now to submit to the Congress in a reprogramming action the monies to do the R&D for that effort. There should be a $43.2 million reprogramming action coming to the Congress with that as part of it.

Mr. **McDade**. What is the procurement strategy for the program?

General **Cianciolo**. We intend to procure launchers for the aircraft that I just mentioned. We are going to equip Scout aircraft first. We will equip the OH-58D or AHIP aircraft, with two launchers each and then we will integrate the generic launcher or the UH-60, AH-1 Cobra and AH-64 Apache, assuming when we get the R&D dollars to do that.

Mr. **McDade**. Is any competition going to occur in this program?

General **Cianciolo**. Sir, the answer to that is yes. Competition will be introduced through a leader-follower relationship.

Mr. **McDade**. Well, provide it for the record.

General **Cianciolo**. Yes sir.

Mr. **McDade**. And let us know.

[The information follows:]

The initial production contract will be sole source to General Dynamics and Bell Helicopter Textron, Inc. and will include the delivery of a Technical Data Package (TDP). This TDP will then be utilized to compete the launcher during follow-on procurements.

Mr. **McDade**. This new requirement is going to require a lot of training in the air to air role for people in choppers, isn't it?

General **Cianciolo**. Yes sir, that is correct.

Mr. **McDade**. Are you confident that you are not going to degrade the other purposes for which the airframes are used?

General **Cianciolo**. Yes sir, I am confident that we will be able to train the pilots to employ the weapon while they are performing their other missions.

Mr. **McDade**. Well, it seems when you get all of these helicopters equipped, and they will be used for air to air defense, in the middle of the battle, there will be a very busy fellow trying to do all this work in one aircraft.

General **Cianciolo**. Sir, our initial effort is to provide a self-defense capability to the observation helicopters. They are out doing the scouting missions and they are the ones who could come in contact with an attack aircraft. We are providing them with the means to defend themselves against that aircraft, since their armament, maneuverability and speed differentials are somewhat deficient when compared to threat attack helicopter capabilities and intentions that our foe has. So I would think that if I were a Scout pilot, I would feel a lot better having that thing than not having it.

Mr. **McDade**. Is there an IFF system involved in this process?

General CIANCIOLO. No sir, not as part of the Stinger system itself.

Mr. MCDADE. Nothing in the mods to the aircraft or anything to include that?

General CIANCIOLO. No sir. The concept is to be able to visually identify the attack aircraft and engage it.

Mr. MCDADE. Please answer the rest of the questions for the record.

[CLERK'S NOTE.—Questions submitted by Mr. McDade and the answers thereto follow:]

QUESTION. What is the employment concept for each aircraft type? Do you envision dedicated air defense aircraft platforms?

General CIANCIOLO. There is no change from the existing employment concepts of these Attack, Scout, and Utility helicopters even though the air-to-air Stinger significantly increases their capability in the performance of their primary mission. The Army is examining the concept of launching air defense missiles, as a part of Forward Area Air Defense, from the AH-64 or UH-60 aircraft as a dedicated air defense platform. At this time it appears to be technically feasible and tactically desirable.

QUESTION. How many launchers will be provided for each aircraft so equipped, and how many aircraft for each type will be modified?

General CIANCIOLO. Quantities by type aircraft are 1,350 systems for 675 AH-64's, 1298 systems for 720 OH-58's, 625 for 625 AH-1S's and 525 systems for 525 UH-60's.

QUESTION. What specifically is being procured in fiscal year 1987?

General CIANCIOLO. The $28.8 million requested in fiscal year 1987 will fund the procurement of 73 systems. $8.1 million of this total will be used for the design and manufacture of production tooling and test equipment.

QUESTION. If the fiscal year 1986 R&D reprogramming is not approved, what will be the impact on the fiscal year 1987 procurement?

General CIANCIOLO. There is no impact on the fiscal year 1987 procurement since these launchers are intended for the OH-58 aircraft. However, it will delay the AH-64 First Unit Equipped (FUE) from fiscal year 1989 to fiscal year 1991.

[CLERK'S NOTE.—End of questions submitted by Mr. McDade.]

## HELLFIRE ON BLACKHAWK

Mr. CHAPPELL. Let me ask you a couple of questions, General. The fiscal year 1986 RDT&E appropriation provided some $17 million for adding the capability of the Black Hawk helicopter missiles to shoot Hellfire missiles. As we understand it, we provided the means for completion of the development activities. What is the status of that program?

General CIANCIOLO. Sir, we, the program is continued. We have had contractors firing with it from the aircraft, and now the aircraft has been turned over to the government to continue to do that testing from the Army point of view, and we found it to be a successful program to date.

Mr. CHAPPELL. Are there other questions?

Mr. Miller, do you have questions?

If not, I am prepared to put the rest of the items in the record, unless you have some.

Mr. Miller. Just one question, if I may.

### EH-60 QUICK FIX SYSTEM

You had mentioned about the EH-60 Quick Fix system and the fact that it will also be fielded to the National Guard and Army Reserve. How many of these systems will be fielded and what is the timetable for that?

General Cianciolo. Sir, there are ——— EH-60A Quick Fix II aircraft that will be fielded. The first EH-60A was delivered to the systems integrator in January of this year and we expect to conduct first article testing in April 1987.

Initial operational capability is scheduled to be in first quarter, FY88.

Mr. Miller. And then it would be possibly '88 before the Guard and Reserves would have that aircraft, is that right?

General Cianciolo. The National Guard, will receive six EH-60A helicopters in that 4th Quarter, FY89. They will also receive the EH-1 Quick Fix I aircraft as they are replaced by EH-60A Quick Fix II helicopters in the active force. We can give you a schedule for that.

Mr. Miller. If you would furnish that for the record I would appreciate it.

General Cianciolo. Yes sir.

[The information follows:]

A total of ——— EH-60A QUICKFIX electronic warfare (EW) aircraft are going to be procured with ——— being issued to aviation units with mission equipment packages. The five left over are operational floats. Initial operational capability of the EH-60A will be in ———. Priority will be to the active force but 6 EH-60A's will be issued in fourth quarter fiscal year 1989 to the National Guard which has all the operational slots for EW helicopters. The National Guard will also receive the 30 EH-1 QUICKFIX I aircraft currently serving in the active force.

Mr. Chappell. Place all of the unasked questions in the record at this point.

General, thank you very much. We appreciate you being here, and the committee will stand adjourned until 1:30 this afternoon.

[Clerk's note.—Questions submitted for the record and the answers thereto follow:]

## UH-60 Black Hawk Utility Helicopter

### FISCAL YEAR 1986 PROGRAM

Question. The budget includes $155.4 million for procurement of 78 UH-60 Black Hawk helicopters and $195 million for advance procurement for fiscal year 1988. In fiscal year 1986, $228.7 million was appropriated for 80 Black Hawks and $199 million in advance procurement. Gramm-Rudman-Hollings sequestered $20.2 million of this amount. What impact will the sequestration have on the quantity of aircraft to be procured?

General Cianciolo. The Black Hawk Project Manager's fiscal year 1986 funding for the UH-60A Black Hawk is the following:

[In millions of escalated dollars]

| | Appropriated 1986 | After official decrement 1986 | Released to PM 1986 | Gramm-Rudman-Hollings program ¹ 1986 |
|---|---|---|---|---|
| Aircraft quantity dollar value | | | | |
| Basic | 228.7 | 210.9 | 207.7 | 198.9 |
| Advance procurement | 199.0 | 199.0 | 181.3 | 190.8 |
| Total | 427.7 | 409.9 | 389.0 | 389.7 |

¹ Plan to reprogram and redistribute as shown. The Gramm-Rudman-Hollings sequestration will permit the procurement of 78 UH-60A Black Hawk aircraft in fiscal year 1986, defer $[illegible] million contingency (avionics) items and $[illegible] million for refurbishment of 450 gallon external fuel tanks, defer providing $[illegible] million advance procurement for termination liability funding the fiscal year 1986-1988 T-700 series engine MYC in fiscal year 1986 for fiscal year 1987, and defer $[illegible] million of planned engineering improvements and alternate vendor source qualifications in fiscal year 1986.

QUESTION. What procurement quantity flexibility exists in the current multiyear contracts? Will this flexibility preclude your having to renegotiate the multiyear contract as a result of Gramm-Rudman-Hollings?

General CIANCIOLO. The fiscal year 1985-1987 airframe MYC provides in addition to the fiscal year 1986 and fiscal year 1987 increments, options for procuring 25 more aircraft in each fiscal year 1986 and fiscal year 1987. However, there is no provision in this MYC to procure a reduced quantity. There is a plus or minus 10 percent variation in quantity clause in the fiscal year 1986-1988 T-700 series engine MYC. However, there is no requirement to renegotiate the fiscal year 1985-1987 airframe MYC or fiscal year 1986-1988 T-700 series engine MYC in fiscal year 1986. If the Gramm-Rudman-Hollings act is fostered in fiscal year 1987, there is a high probability that the fiscal year 1985-1987 airframe will be renegotiated in fiscal year 1987.

## UH-60 MULTIYEAR CONTRACTS

QUESTION. The budget proposes advance procurement funding for a fiscal year 1988-1989-1990 multiyear contract for the airframe. This contract will "buy out" the Black Hawk program.

How much of the fiscal year 1987 advance procurement budget is for this multiyear contract?

General CIANCIOLO. The fiscal year 1987 advanced procurement request for the fiscal year 1988-1990 airframe MYC is $113.2 million of the $195.0 million.

QUESTION. Has the Army made a firm decision to stop buying Black Hawks in 1990 when the approved quantity of 1,107 is procured?

General CIANCIOLO. A Department of the Army Program Review (DAPR) is in process to decide on an increased procurement quantity of Black Hawks.

QUESTION. If there is a chance that additional Black Hawks are to be procured, why should Congress approve a multiyear contract that anticipates a phase-down of production and the end of procurement?

General CIANCIOLO. A three year (fiscal year 1988-1990) MYC is a more cost-effective means to procure the Army's remaining UH-60A Black Hawk requirements over fiscal year 1988-1990 vice three single year contracts, regardless of the quantity procured. If the procurement objective is increased via the DAFR process, the fiscal year 1990 procurement quantity and requirements will be the fiscal year 1988 budget request to accommodate the revised requirement.

QUESTION. What is the minimum economic production rate for Black Hawk, and what would it cost to procure at that rate?

General CIANCIOLO. The minimum economic production rate for UH-60A Black Hawk is six aircraft per month. The cost to procure the remainder of the program at this rate is as follows:

[In millions of dollars]

| | Fiscal year | | | | |
|---|---|---|---|---|---|
| | 1988 | 1989 | 1990 | 1991 | Total |
| Aircraft quantity | [illegible] | 72 | 72 | 47 | 262 |
| Total cost | $410.3 | $576.1 | $[illegible] | $289.5 | $1,551.[illegible] |

This reflects a plus-up of $104.5 million.

QUESTION. The Army recently awarded a multiyear contract for the T-700 series engine for the Black Hawk and other aircraft. The Army certified that the design of the engine was stable and suitable for the multiyear procurement. What plans does the Army have to change the engine after fiscal year 1988?

General CIANCIOLO. The Army is considering a competitive, already developed engine for incorporation on the 1,108th UH-60A Black Hawk (system 1990). This plan assumes approval to increase the UH-60A Black Hawk procurement objective above 1,107 Black Hawks.

QUESTION. The Army has been directed to study the possibility of establishing a second source for the T-700 series engine and report to the Committee by March 30. What are the results of your analysis thus far, and when will the report be submitted?

General CIANCIOLO. The second source (competitive) engine analysis is in process. Upon completion, a copy of the competitive engine report will be provided to the Committee.

QUESTION. What alternatives are being considered to increase competition in this engine, and what are the advantages and disadvantages of each?

General CIANCIOLO. The following four alternatives are being considered to increase engine competition: full and open competition; contract for each identical copy based on a government furnished technical data package; contract with General Electric Company to develop a second source; and second source all buy items. The advantages and disadvantages of the various alternatives will be provided to the Committee in the competition engine report.

QUESTION. What is the role of the Army Competition Advocate in the consideration of alternatives?

General CIANCIOLO. The U.S. Army Aviation System Command Competition Advocate and U.S. Army Competition Advocate are reviewing procurement transactions to insure they are in compliance with the March 1985 Competition in Contracting Act (CICA). In addition, the second source (competitive) engine initiatives will be staffed through the advocates cited above.

### UH-60 B-MODEL BLACK HAWK

QUESTION. What consideration is the Army giving to developing and procuring a "B" Model of the Black Hawk?

General CIANCIOLO. The Army is developing and formulating a B-Model Black Hawk requirement. This requirement will be considered during the forthcoming Program Review.

QUESTION. What Black Hawk improvements does the Army desire and what alternatives are being considered?

General CIANCIOLO. The Army is developing and formulating its desires and alternatives. The requirement and alternatives will be briefed during the forthcoming Program Review.

QUESTION. What costs are associated with these improvements, and what portion of these costs are included in your five year budget?

General CIANCIOLO. A cost estimate has not been developed to accommodate the B-Model Black Hawk program, since the requirement is only in the formative stages. Consequently, no funds have been requested for this program.

### HELLFIRE ON BLACK HAWK

QUESTION. The fiscal year 1986 RDT&E appropriation provided $17 million to acquire a capability to launch Hellfire missiles from Black Hawk helicopters. Those funds were specified as being for completion of development activities and to initiate low rate initial production.

What specifically is being done with the funds provided for fiscal year 1986? When will low rate initial production using those funds commence?

General CIANCIOLO. The fiscal year 1986 RDT&E funds will be used to fully qualify the Hellfire missile system on the Black Hawk in readiness for production.

QUESTION. This Committee has repeatedly instructed the Army to include funds for this program in its budget requests. Why have no funds been requested in the fiscal year 1987 budget for Hellfire on the Black Hawk?

General CIANCIOLO. RDT&E funds provided in fiscal year 1986 are adequate to complete qualification of this system. Since the production contract award is not anticipated until calendar year 1988, procurement funds will not be required until fiscal year 1988. The Black Hawk Project Manager has requested funds in the fiscal year 1987 President's Budget beginning in fiscal year 1988 to procure Hellfire systems.

QUESTION. It appears that the Army is concerned with the ability of its helicopters to defend themselves, and is examining air-to-air capabilities.

What is the status of providing air-to-air capabilities.

General CIANCIOLO. The UH-60, as well as the AH-64 and AH-1 ATAS integrations, are scheduled to be funded in fiscal year 1986 through a reprogramming action currently on-going. Given that the reprogramming is successful, the UH-60 ATAS integration will begin in September 1986 and be completed by December 1987. Procurement of ATAS peculiar hardware in support of "special" high priority units will occur in fiscal year 1988. Due to the higher priority of the AH-64 and OH-58C/D ATAS fielding, procurement for the remaining UH-60 fleet will begin in fiscal year 1989.

Question. What funds are requested in the fiscal year 1987 budget for that purpose?

General Cianciolo. Black Hawk has requested no procurement funds in fiscal year 1987 in support of air-to-air stinger.

Question. Provide for the record a funding profile and schedule for this effort?

General Cianciolo. The Black Hawk Project Manager recently received the draft system specification for the air-to-air stinger on Black Hawk for review. Sufficient information is not available at this time to define the procurement funding requirements.

### BLACK HAWK MODS

Question. The budget includes $7.7 million for Black Hawk mods. Last year, you forecast a fiscal year 1987 budget of $14.4 million. Why was this amount cut in half?

General Cianciolo. The line was reduced due to reduced funding levels and other priorities.

Question. What specifically is to be procured in fiscal years 1986 and 1987?

General Cianciolo. Based on current funding of $12.930 million in fiscal year 1986 and $7.7 million in fiscal year 1987, the following modifications are planned:

[Dollars in millions]

| | Quantity | Fiscal year 1986 | Quantity | Fiscal year 1987 |
|---|---|---|---|---|
| Night vision compatible lighting | 329 | $6.126 | | |
| Pressurized overspeed unit | 275 | 3.448 | 132 | $0.500 |
| Wire strike protection system | 245 | 2.662 | 505 | 5.700 |
| Cargo hook | 802 | .698 | | |
| External stores support system | | | | .900 |
| SINCGARS radio | | | 88 | .500 |
| Improved airspeed system | | | 88 | .100 |
| Engine control quadrant | | | 160 | .200 |
| Total | | 12.930 | | 7.700 |

## AH-1 Cobra-TOW Modifications

### LASER AUGMENTED AIRBORNE TOW

Question. The budget includes $61 million for the AH-1S Cobra-TOW Modification program. This program consists of three elements: Laser Augmented Airborne TOW, Cobra C-FLEX and C-NITE. We will discuss each of these in turn.

For the Laser Augmented Airborne TOW, the budget includes $9.3 million. What does this program entail?

General CIANCIOLO. Procurement of 85 Laser Range Finders (LRF) to complete procurement of this capability for the Modernized COBRA Fleet. Essential to effectiveness of the aircraft and its primary weapons, the TOW II and the Hydra 70 Rockets.

QUESTION. Last year, you expected fiscal year 1986 and 1987 funding of $11.2 million and $15.8 million. Why has this been reduced to $8.9 million and $9.3 million?

General CIANCIOLO. Fiscal Year 83/84 funds in the amounts of $6.3 million were used to procure 80 units during Fiscal Year 85/86. Early procurement facilitates incorporation into the telescopic sight unit (TSU) concurrent with C-NITE production. Procurement of these units reduced the quantities needed to be procured with Fiscal Year 86 funds from 107 to 85 and with Fiscal Year 87 funds from 143 to 85.

QUESTION. Last year, the total procurement plan was 250 kits for $27.0 million. What is the current plan and why has it changed?

General CIANCIOLO. The total procurement plan is still 250 kits and the current program cost is $24.5 million. The program for each year is as follows:

| | Prior year | FY 86 | FY 87 | Total |
|---|---|---|---|---|
| Last year's plan | | | | |
| Quantity | 0 | 107 | 143 | 250 |
| Cost ($ in millions) | 0 | 11.2 | 15.8 | 27.0 |
| Current plan | | | | |
| Quantity | 80 | 85 | 85 | 250 |
| Cost ($ in millions) | 6.3 | 8.9 | 9.3 | 24.5 |

The plan has changed due to our ability to procure the first 80 units earlier than previously planned. This will lower the total program cost. Also, the program for Fiscal Year 86 and Fiscal Year 87 may experience additional cost savings as the result of contract negotiations.

QUESTION. The budget back-up sheets indicate that $7.3 million was provided for this program in Fiscal Year 83/84. Please explain this since it was not shown last year.

General CIANCIOLO. The $6.3 million was obligated in Fiscal Year 85/86 utilizing Fiscal Year 83/84 funds to procure 80 units. Expiring year funds facilitated use of Fiscal Year 83 funds and additionally Fiscal Year 84 funds were used for this first increment of Laser Range Finder procurement to gain potential savings resulting from concurrent incorporation with C-NITE.

### COBRA C-FLEX

QUESTION. The CORBA C-FLEX program is funded at $98.3 million in fiscal year 1986 and $3.1 million in fiscal year 1987. What does this program entail?

General CIANCIOLO. The C-FLEX program entails:

| Fiscal Year 86 | *Millions* |
|---|---|
| Rotor improvements | $11.9 |
| K-FLEX shaft | 2.1 |
| G to S conversion | 44.0 |
| ITSGMS* | 10.3 |

| | Millions |
|---|---|
| TOW reliability | 1.8 |
| Radio upgrade | 8.3 |
| Category "C" trainers | 8.9 |
| Test measurement & diagnostic equipment | 11.0 |
| Total | 98.3 |
| Fiscal Year 87: Rotor Improvements | 3.1 |

[1] Improved Test Set, Guided Missile System.

QUESTION. Last year, Congress provided $84.8 million for C-FLEX. Why has it been increased to $98.3 million, and what was the source of funds?

General CIANCIOLO. C-FLEX funding for Fiscal Year 86 has been increased for Category "C" Trainers (Congressional Mark-up) and Department of the Army plus-up for Test Measurement and Diagnostic Equipment (TMDE).

QUESTION. Last year the C-FLEX program was projected to be funded at $43.9 million in fiscal year 1987. Why has the budget been reduced to $3.1 million?

General CIANCIOLO. Department of the Army higher priority requirements resulted in reallocation of all but $3.1 million.

QUESTION. What is the total cost and funding profile for C-FLEX? Explain any change from the $298.7 million estimated last year.

General CIANCIOLO. The C-FLEX funding profile is as follows:

| Fiscal year: | Millions |
|---|---|
| 1985 and prior | $120.2 |
| 1986 | 98.3 |
| 1987 | 3.1 |
| 1988 | 38.0 |
| 1989 | 35.8 |
| 1990 | 1.7 |
| Total | 297.1 |

Category "C" Trainers ($10.0 million) Congressional increase and Department of the Army decrements resulted in a net decrease to the C-FLEX profile of $1.6 million.

## C-NITE

QUESTION. The C-NITE program is funded at $48.6 million. What does this program entail?

General CIANCIOLO. The C-NITE program consists of procurement of 240 C-NITE kits.

QUESTION. What are the development and testing milestones for C-NITE, and what are the results of tests to date?

General CIANCIOLO. There are no test results to date. C-NITE Subsystem No. 1 integrated in Test Vehicle February 1986. Contractor Flight-Firing Tests begin April 1986. Formal Bench Qualification will not begin until May 1986. Contractor Flight Test Complete June 1986. Critical Issues Demonstration complete July 1986. Government Prototype Qualification Test complete October 1986. C-NITE Production Decision Review October 1986.

QUESTION. The Committee has directed that you provide a report on testing results before procurement funds are obligated. When will we receive this report?

General CIANCIOLO. Testing is not complete. Letter of Intent to proceed with C-NITE production tooling was provided to Committee in March 1986. Plan is to provide test results to the Committee prior to C-NITE kit production contract in October 1986. Report on test results will be provided.

QUESTION. Last year, you estimated that the planned procurement of 500 kits would cost $134.5 million. What is your current estimate, and why has it changed.

General CIANCIOLO. Current estimate is still $134.5 million pending results of implementation proposal negotiations and production proposal negotiations, including $19.0 million RDT&E.

QUESTION. Last year, you expected to procure 107 kits in fiscal year 1986 and 240 kits in fiscal year 1987. What is your current estimate, and why has it changed?

General CIANCIOLO. Current estimate is still 107 kits and 240 kits in Fiscal Year 86 and Fiscal Year 87, respectively and the current estimate has not changed pending receipt of production proposal in Third Quarter Fiscal Year 1986.

QUESTION. What is the procurement strategy for C-NITE?

General CIANCIOLO. The first two increments of C-NITE kits will be sole source to Hughes Aircraft Company (HAC). The first lot of airframe modification kits ("A" kits) will be acquired from HAC with Lots II/III to solicit competitive proposals. An initial list of breakout items have been identified as competition candidates for acquistion during the Fiscal Year 87/88 time Frame. The final increment for C-NITE kits will solicit competitive proposals.

QUESTION. What is the obligation status of funds appropriated to date?

General CIANCIOLO. The current obligation status:

*Fiscal year 84 COBRA Program Manager Office RDT&E*

| | |
|---|---|
| Program funds | $16,837,500.00 |
| Obligated | 16,829,822.46 |
| Unobligated (To be held for price increases on Government furnished equipment requisitions) | 7,677.54 |

*Fiscal year 85 COBRA Program Manager Office RDT&E*

| | |
|---|---|
| Program funds | $2,300,000 |
| Obligated as of 7 Mar 1986 | 104,400 |
| Unobligated (April 1986 contract award) | 2,195,600 |

No Aircraft Procurement Appropriation funds have been obligated.

## OPTIC IMPROVEMENT

QUESTION. Last year, you projected initial procurement funding for optic improvement modifications in 1987. Why has this now slipped to fiscal year 1988?

General CIANCIOLO. The delay in the program is due to the delay in receiving the Research and Development funding. In addition, part of the delay is due to the complexity of the technology and the difficulty in obtaining a clear definition of the requirements for each system. We are currently in the process of awarding a contract to define the specific design concept which will be followed by a full engineering development and qualification contract. The two contracts represent approximately 18 months of effort.

### UH-1 MODIFICATION

QUESTION. The budget includes $6.3 million for UH-1 helicopter modifications. Last year, you projected a fiscal year 1987 budget of $37.9 million. What accounts for the decrease?

General CIANCIOLO. Over the same period of time the aviation TOA was reduced from $4.134 billion to $3.264 billion. This resulted in a restructuring of funding priorities with subsequent reductions in the UH-1 mod line.

QUESTION. The multiband radio mods which were to have begun in fiscal year 1987 have now been postponed to fiscal year 1988. Why?

General CIANCIOLO. Reduction in Army TOA, hence Aviation TOA, resulted in more requirements than funds available and a reduction in the UH-1 Mod budget line. This results in delays in planned system improvements.

QUESTION. Likewise, improved oil filtration mods, map-of-the-earth communications mods, and ARC-164 radios are not funded in fiscal year 1987. Has the Army cancelled or postponed these mods in order to afford the more glamorous end-item hardware?

General CIANCIOLO. Mods have been delayed due to a combination of funding reductions and priorities.

QUESTION. What is the impact of these delays on safety, readiness, and war-fighting capability?

General CIANCIOLO. There will be no adverse impact on safety. Delays will have minimal impact in other areas, however, continued reductions in TOA will eventually impact readiness due to the marginally supportable avionics in the UH-1 fleet.

QUESTION. The single item funded in fiscal year 1987 is the hub spring modification which corrects the so-called "mast bumping" problem. What is the status of development and testing of this modification? What are the results of tests to date, and what further tests are planned?

General CIANCIOLO. The development of the hub spring (less the warning device) is complete. Contractor flight tests are essentially complete; sufficient fatigue testing is complete to make fatigue life calculations, and static and endurance testing is also complete. Analysis of test data is on-going. Fatigure tests will continue and the government will conduct operational flight test and a preliminary airworthiness evaluation at Edwards Air Force Base. Conclusions are that flapping is reduced 10-15 percent for steady state maneuver. Some components (M/R mast, M/R blade, M/R collective pin) have reduced lives due to hub spring in combination with NOE flight maneuver. The hub spring will not prevent mast bumping but will provide an extra margin of safety over no modification.

QUESTION. The justifications indicate that the Army has had some trouble developing a warning device. Explain this situation.

General CIANCIOLO. The Army desired a warning system that would alert the pilot when he had high flapping angles (potential mast bump situations) and enable him to take corrective action to reduce these flapping angles and thus avoid mast bumping. Actual flight test data indicated the rate of increase in flapping angles was so fast that no time was available for the pilot to receive a warning and take a preventive action. Therefore, alternate methods of alerting the pilot were investigated. One of the major contributors to high flapping angles is maneuvers which involve low "g" flight conditions. It was noted that the low "g" condition preceded the incident of high flapping and may provide time for alerting the pilot and initiating corrective action. Thus, the current warning device planned is a low "g" warning system which will provide an alert to the pilot, which, when combined with pilot training for these conditions should reduce the incidents of high flapping and potential mast bumping situations.

QUESTION. What is the obligation status and schedule for all prior year hub spring modification funds?

General CIANCIOLO. In April 1985, $0.1 million of fiscal year 1985 APA funds were obligated for G-meters which were put into the training fleet at Fort Rucker. In April 1986 approximately $2.2 million (fiscal year 1985 funds) and $5.0 million (fiscal year 1986 funds) will be oligated to procure hub spring modification kits. Fiscal year 1986 and fiscal year 1987 APA funds will be used to procure the warning devices. A production decision regarding the warning device is scheduled for July 1986.

## AIRCRAFT SURVIVABILITY EQUIPMENT

QUESTION. The budget includes two new lines which were neither included or forecast last year. One is "Aircraft Survivability Equipment Modifications—Close Combat", and the other is "Aircraft Survivability Equipment" under the Support Equipment and Facilities. Describe these two programs and why they were not included or forecast last year.

General CIANCIOLO. These requirements were formerly in aircraft lines. The Aircraft Survivability Equipment (ASE) modification line was established to more accurately cover modification to ASE only. The "aircraft survivability equpment" line consolidates "black box" requirements previously scattered thru aircraft mod lines. This minimizes budget turbulence and thus enables better business planning. These were included and approved in last year's budget.

QUESTION. What specifically is to be procured in fiscal year 1987?

General CIANCIOLO. The Fiscal Year 1987 procurement of Aircraft Survivability Equipment is as follows:

| | Each |
|---|---|
| AN/APR-39A(V)1, improved radar warning receiver | 721 |
| AN/ALQ-144A, improved infrared jammer | 242 |
| AN/ALQ-162(V)2, continuous wave radar jammer | 24 |
| AN/ALQ-156(V)2, missile detector | 83 |
| M-130, chaff/flare dispenser | 248 |
| AN/ALQ-136(V)5, radar jammer | 160 |
| IP-1150A mod kits, improved radar warning receiver indicator kits | 3,054 |

QUESTION. According to the justification books, the $3.5 million budgeted for ASE-Close Combat funds kits is necessary to adapt current cockpit displays to interface with the new AN/APR-39A Radar Warning Receiver.

How many kits will be procured?

General CIANCIOLO. 3,054 kits.

AVAILABLE

**Question.** What are the development and testing milestones for the kits?

General **Cianciolo.** These are completed and Engineering Change Proposal approved.

**Question.** What is the procurement strategy for the interface kits?

General **Cianciolo.** They are to be procured concurrently with new IP-1150A indicators which are required to support the AN/APR-39A(V)1 buy.

**Question.** What is the funding and delivery profile for the APR-39?

General **Cianciolo.** AN/APR-39A(V)1 procurement commences in Fiscal Year 1986 under a 2 year multiyear. Fiscal Year 1986 buy is 428 each/$32.8 million; Fiscal Year 1987 is 721 each/$29.1 million. Follow-on buys are: Fiscal Year 1988—590/$25.2 million;

**Question.** Does the fiscal year 1987 budget fund the entire requirement for interface kits?

General **Cianciolo.** Yes, sir.

**Question.** Why is $100 thousand required in fiscal year 1988?

General **Cianciolo.** That is not required.

**Question.** For each item funded in fiscal year 1987 and 1988 provide: Description.

General **Cianciolo.** AN/APR-39A(V)1: Improved Radar Detecting Set. Covers much greater threat than older APR-39(V)1. Threat display is changed to alpha-numeric vs. strobe. Synthetic voice warning and display vs. old display. AN/ALQ-144A: Infrared Countermeasures Set. An updated jammer to counter new electro-optical guidance techniques of advanced heat seeking missiles. RFI: Radar Frequency Interferometer. Provides passive target acquisition of hostile radar emitters. Cues optical sighting systems for subsequent laser range finding designation and subsequent delivery of aircraft munitions. AN/ALQ-162(V)2: Countermeasures Set—provides warning against Surface to Air Missile (SAM) and Airborne Interceptor Missiles that use continuous wave radar guidance. Capable of warning and jamming. AN/ALQ-136(V)2: Radar Jammer for Special Electronic Mission Aircraft to provide protection against SAM, Air-to-Air, Intercept and Anti-Aircraft Artillery. AN/ALQ-156(V)2: Missile detector provides warning of approaching missiles and initiates chaff or infrared decoy disbursement. M-130: General Purpose Aircraft Dispenser manually or automatically disperses chaff or flare decoys.

**Question.** Requirement.

General **Cianciolo.**

| | *Each* |
|---|---|
| APR-39A(V)1 | 3,792 |
| ALQ-144A | 3,262 |
| RFI | 288 |
| ALQ-162(V)2 | 146 |
| ALQ-136(V)5 | 645 |
| ALQ-136(V)2 | 169 |
| ALQ-156(V)2 | 184 |
| M-130 | 4,207 |

**Question.** Development and testing milestones.

General **Cianciolo.**

APR-39A(V)1—Type Classification In-Process Review scheduled June 1986.

ALQ-144A—Type Classification In-Process Review scheduled October 1986.

RFI—Government test Feb. 1988, Type Classification In-Process Review May 1988

ALQ-162(V)2—Complete.

ALQ-136(V)5—Complete.

ALQ-136(V)2—Test in process, complete May 1986, TC IPR Dec 1986.

ALQ-156(V)2—Complete.

M-130—Complete.

QUESTION. Procurement strategy.

General CIANCIOLO.

APR-39A(V)1—2 year sole source multiyear, concurrent spares buy.

ALQ-144A—Initial sole source single year contract with options.

RFI--Competitive Engineering Development with production option.

ALQ-162(V)2—New sole source, single year procurement.

| ALQ-156(V)2: | *Each* |
|---|---|
| EH-60 | 72 |
| EH-1 | 30 |
| OV-1 | 39 |
| RV-1 | 28 |
| RC-12 | 28 |

ALQ-136(V)5—2 step single year competitive contract.

ALQ-136(V)2—Sole source 2 year multiyear with spares.

ALQ-136(V)2—Option on existing sole source contract.

M-130—Competitive single year buy.

QUESTION. Number of items funded to date (under individual aircraft lines).

General CIANCIOLO.

| Aircraft | M-130 | APR-39A(V)1 | ALQ-162(V)2 | ALQ-156(V)2 |
|---|---|---|---|---|
| AH-64 | 215 | | | |
| UH-60 | 791 | 82 | | |
| CH-47 | | 106 | | |
| EH-60 | 72 | | 18 | 30 |
| EH-1 | 30 | | | |
| OV-1D | 102 | | | 11 |
| RV-1 | 28 | | | 24 |
| RC-12D | | | | 28 |

QUESTION. Procurement profile to program completion.

General CIANCIOLO.

| System | Fiscal year— | | | | |
|---|---|---|---|---|---|
| | 1987 | 1988 | 1989 | 1990 | 1991 |
| APR-39A(V)1 | 721 | 360 | 201 | 1443 | 408 |
| ALQ-144A | 242 | 426 | 421 | 311 | 162 |
| RFI | | | 144 | 144 | |
| ALQ-162(V)2 | 24 | 82 | | | |
| ALQ-136(V)2 | | 123 | 46 | | |

| System | Fiscal year |  |  |  |  |
|---|---|---|---|---|---|
|  | 1987 | 1988 | 1989 | 1990 | 1991 |
| ALQ 136(V)5 | 160 |  |  |  |  |
| ALQ 156(V)7 | 88 |  |  |  |  |

Note — [illegible] ALQ 144 to be modified to ALQ 144A configuration fiscal year 1989 and 1990.

**Question.** Number of aircraft, by type, to be equipped.

General CIANCIOLO.

| System | Quantity | Aircraft |
|---|---|---|
| APR 39A(V)1 | 651 each | AH 64 |
|  | 1,098 each | AH 1 |
|  | 578 each | AHIP |
|  | 585 each | OH 58 |
|  | 212 each | CH 47 |
|  | 432 each | [1] UH 60 E |
| ALQ 144A | 411 each | AH 64 |
|  | 499 each | UH 60A |
|  | 47 each | EH 60A |
|  | 556 each | AH 1 |
|  | 310 each | UH 1 |
| RFI | 788 each | AHIP |
| ALQ 162(V)1 | 72 each | EH 60A |
|  | 35 each | OV 1D |
|  | 24 each | RV 1 |
|  | 38 each | RC 12 |
|  | 30 each | EH 1 |
| ALQ 156(V)7 | 72 each | EH 60A |
|  | 35 each | OV 1D |
|  | 38 each | RC 12 |
|  | 30 each | EH 1 |
| ALQ 136(V)5 | 485 each | AH 64 |

[1] Training base.

Last December, the General Accounting Office issued a report titled "Army Helicopters: Changes Needed to Provide More Effective Self-Protection Capability". GAO concluded that: ———.

**Question.** Has the Army established helicopter attrition goals and a methodology for determining the contributions that self-protection equipment makes to achieving those goals as recommended by GAO? If not, what was the basis of your 1987 budget?

General CIANCIOLO. Aircraft Survivability Equipment (ASE) requirements are predicated on analysis of current and emerging threat weapons against the survivability of Army aircraft in all mission scenarios. An ASE Compatibility Requirements Study in November 1983 addressed the Scout Attack mission based on a modified Division War Game (DIVWAG) scenario against the Soviet threat in the Fulda Gap, Europe. An April 1982 SEE SAFE analysis analyzed the survivability of Special Electronic Mission Aircraft (SEMA) aircraft flying thru VII Corps mission profiles. This analysis considered the many Soviet threats to these systems and their unique mission profiles. The attrition of aircraft was examined in various flight regimes and with different suites of ASE. These basic studies are continually being updated and validated thru continuing studies and actual tests. Efforts for Force Development Test and Evaluation (FDTE) have been initiated for the

SEMA and Scout Attack aircraft. The conclusions of the GAO report evaluate only one aspect of the Army's aircraft survivability equipment program, scout-attack operations. It also focuses on ASE as a sole countermeasure therefore ignoring other critical aspects of survivability such as tactics and other combined arms lethal countermeasures. As commented by Mr. Donald C. Latham, Office Secretary of Defense (Command, Control and Communications Intelligence), in his DOD reply to GAO "This report appears to do a major disservice by not fully recognizing the positive efforts the Army is making to field ASE on several categories of aircraft. In spite of these fiscally constrained times, the Army has significantly increased its ASE budget and is vigorously pursuing new technologies to address a constantly expanding threat." The Army has not established helicopter attrition goals as recommended by the GAO, however, the Army has established methodologies for determining the contributions that self-protection equipment makes to serve as a basis for its budget requests to include Fiscal Year 1987.

QUESTION. How did the Army go about determining which helicopters get self-protection equipment, and why do you believe that some aircraft can be deployed without this equipment?

General CIANCIOLO. Determination was made by carefully analyzing the ASE requirements and creating a high priority core ASE program to equip the forward deployed, Rapid Deployment Forces, other high priority units and the training base. This decision was based on a thorough analysis of mission scenario vs. threat and subsequent determination of an ASE suite for optimizing survivability as indicated by the previously mentioned studies. As mentioned in the Army reply to the GAO comment concerning aircraft being deployed without ASE, it is not the Army's intention to equip all aircraft with ASE, since not all aircraft are intended for use in high risk, direct combat scenarios nor are they all forward deployed and immediately exposed to hostilities. Thus, the Army's program is structured to meet the highest priority requirements with the funds available. Requirements for any unfunded ASE are being tracked.

QUESTION. What has the Army done to establish training and indoctrination programs to assure that self-protection equipment is effectively operated and maintained, as recommended by GAO?

General CIANCIOLO. ASE Trainer I was just fielded as an interim training system to 300 aviation companies at 140 locations to improve readiness with classified training on threat operations and tactics. A follow-on deskside trainer, in-flight cockpit trainer and an aviation tactics and range trainer are in development. The Army has recognized the serious need for training and these programs have high priority.

[CLERK'S NOTE.—End of questions submitted for the record.]

WEDNESDAY, MARCH 5, 1986.

# ARMY MISSILE AND OTHER PROCUREMENT

## WITNESSES

MAJ. GEN. AUGUST M. CIANCIOLO, USA, DIRECTOR OF WEAPONS SYSTEMS, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT AND ACQUISITION

BRIG. GEN. BILLY M. THOMAS, USA, DEPUTY DIRECTOR, COMBAT SUPPORT SYSTEMS, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT AND ACQUISITION

COL. THOMAS M. DEVANNEY, USA, CHIEF, MISSILES AND AIR DEFENSE SYSTEMS DIVISIONS, ODCSRDA

## INTRODUCTION

Mr. CHAPPELL [presiding]. The meeting will please come to order.

This afternoon the committee will hear testimony on missile procurement and other procurement requests of the Army. Pursuant to a motion made and passed in open session, these hearings are being held in executive session because of the classification of material to be discussed.

The principal witnesses are Major General August M. Cianciolo, Director of Weapons Systems; and Brigadier General Billy M. Thomas, Deputy Director of Combat Support Systems.

Gentlemen, as you know, the missile procurement and other procurement accounts include a large number of programs and projects. We wish to hear testimony on many of them, and unfortunately our time is limited.

Therefore, I would appreciate your making only a very brief statement, so that we can move on to the questioning.

Your entire prepared statements will, of course, be made a part of the record.

Please proceed.

General CIANCIOLO. Thank you. Good afternoon, sir. It is a pleasure for me and honor for me to present the Army's program for the procurement of missiles for 1987 to you and the members of your committee.

I will also be assisted by Colonel Thomas Devanney, who is on my right. He is the Chief of the Missile Division within my directorate.

I have a prepared statement I would like to submit for the record. I just have four vugraphs.

Mr. CHAPPELL. It will be placed in the record.

## OVERVIEW—MISSILE PROCUREMENT

General CIANCIOLO. If I could have the first slide please.

[Slide follows:]

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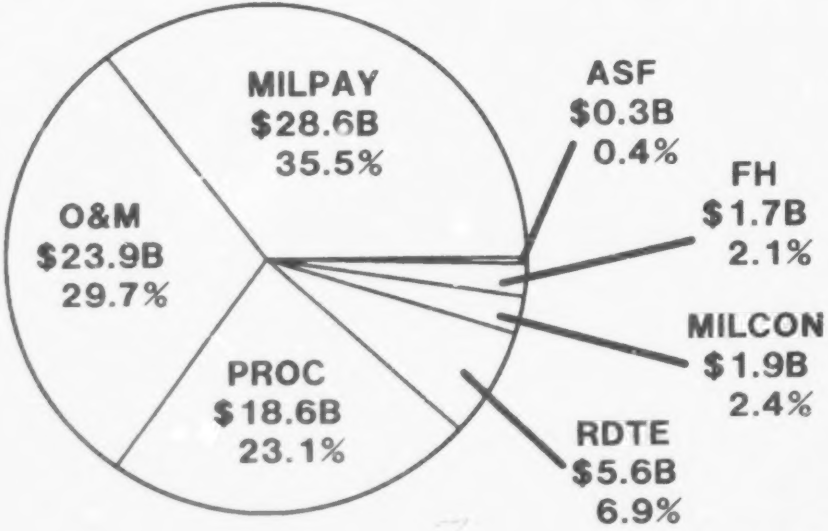
# FY 87 PRESIDENTS BUDGET
# US ARMY - BY PROGRAM



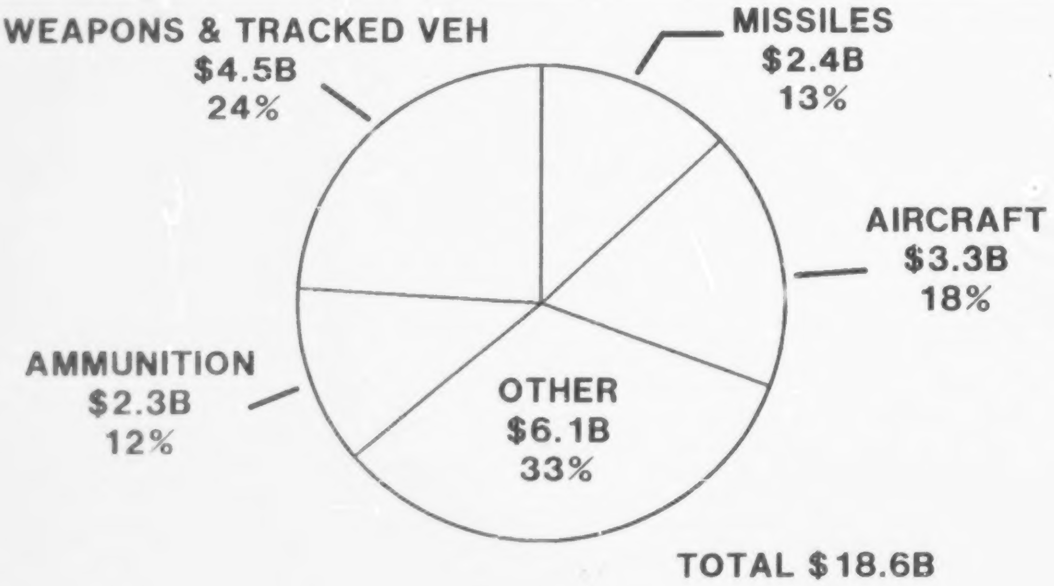
General CIANCIOLO. Today we are focusing on the procurement portion of the 1987 Army budget. The procurement account represents efforts to acquire new equipment for our soldiers. While procurement represents only the third largest part of the Army budget, it frequently provides for most of the controversy.

Let me assure you that we are taking the necessary steps to reduce our spending while getting the best weapons for soldiers in the field.

Next slide please

[Slide follows:]

# FY 87 PRESIDENT'S BUDGET
# U.S. ARMY PROCUREMENT
# ($ IN BILLIONS)



General CIANCIOLO. Narrowing our focus a little more, this is a breakout of the Army's fiscal year 1987 procurement budget. This afternoon I will provide you information on the missile part of the procurement account.

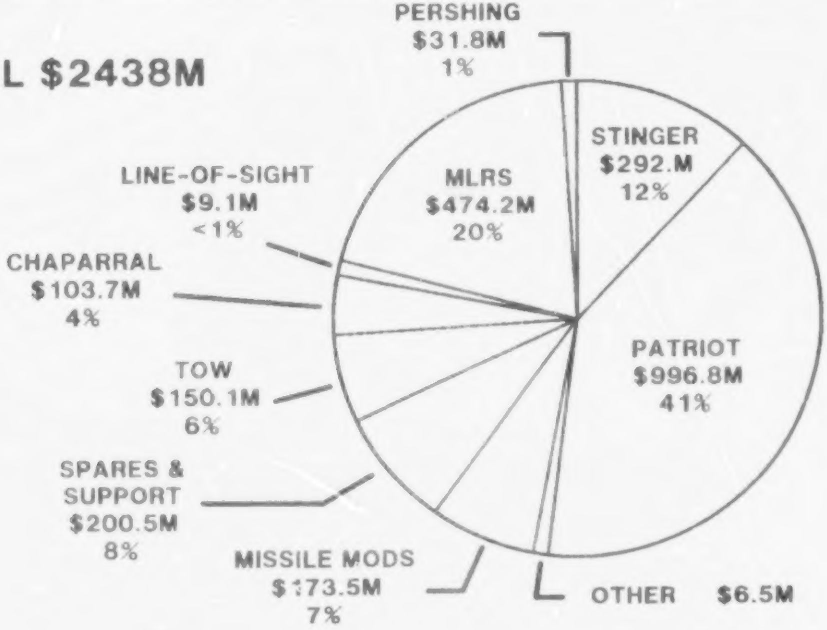
While the missile part of the procurement account is relatively small compared to the other categories, it is very important. From these moneys we acquire the weapons for air defense, tactical artillery, and anti-armor applications.

Our air defense missile systems provide an umbrella for our field troops as well as critical installations and air bases. Tactical artillery is used to interdict and destroy enemy troops and logistic lines behind enemy lines. And of course anti-armor weapons like TOW are an integral part of today's Army and are used to neutralize tanks, armored carriers, and enemy fortifications.

[Slide follows:]

# FY 87 MISSILES PROCUREMENT
# ($ IN MILLIONS)

**TOTAL $2438M**



General CIANCIOLO. This slide provides a more detailed breakout of the missiles procurement account, and as you can see, the Patriot missile system accounts for the largest part of the missiles budget. Three systems; Multiple Launch Rocket System, Stinger, and Patriot use up almost three quarters of our budget in this appropriation.

These are exceptionally important missiles systems, which provide us air defense and long-range artillery capabilities. All three of these systems are well into the procurement phase of the life cycle and are performing very well in the field.

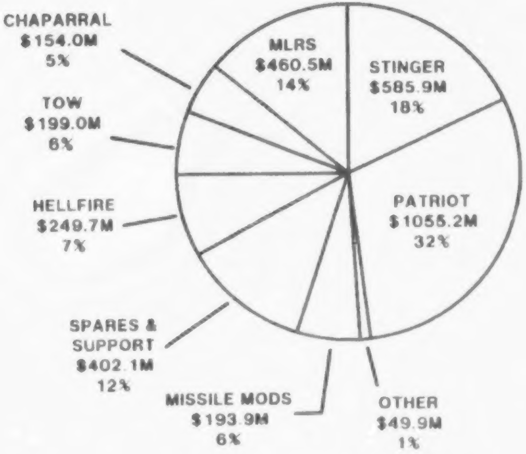
You may note a wedge in the fiscal year 1987 missile budget for a line-of-sight weapon which is part of the forward area air defense system to provide mobile air defense support to our front-line heavy divisions. Although this is a very small part of the budget, it begins procurement of weapons to fill the critical void of the air defense for forward areas.

We will need your support to get this system off to a strong start.

[Slide follows:]

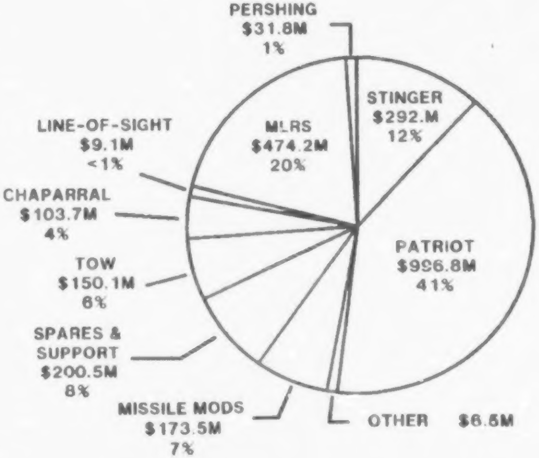
# MISSILE PROCUREMENT
# ($ IN MILLIONS)

## 87 COLUMN OF FY 86 BUDGET



TOTAL $3350M

## FY 87 BUDGET



TOTAL $2438M

General CIANCIOLO. Finally, I thought it would be useful to compare this year's missile procurement request with last year's projected requirement for fiscal year 1987. As you can see, our projects have been reduced by over 25 percent. While much of this represents our efforts to reduce spending, some reductions were mandated by other conditions. The bulk of the reduction in the Stinger budget was related to the cancellation of the Sergeant York program.

The Army had planned to deploy Stinger with every Sergeant York on the battlefield. The elimination of funding for Hellfire in 1987 occurred due to production problems in the plant. Reduction of the Patriot budget is due to the inclusion of proposed multiyear contrct cost avoidance. Other changes were a result of changes in cost estimates, OSD budget directives and changes in the scope of various programs.

This concludes my introductory remarks, and General Thomas will now proceed with his.

[General Cianciolo's statement follows:]

Mr. Chairman, I am MG August M. Cianciolo, Director of Weapons Systems in the Office of the Deputy Chief of Staff for Research, Development, and Acquisition. It is an honor to appear before you today to present the Army's Fiscal Year 1987 procurement request for missiles.

The account includes seven missile systems - the Patriot, the Multiple Launch Rocket System (MLRS), the Pershing II, the TOW 2, the Hellfire, the Stinger, and the Chaparral. One of these, the Hellfire, has no 1987 procurement request due to current production problems. Hellfire is scheduled to resume procurement in 1988. It also includes funding for missile modifications, other support equipment, and a Line-of-Sight (Forward) weapon for forward area air defense of heavy forces. This latter weapon represents a new start and is envisioned to be a gun/missile mix. Three programs, Patriot, MLRS, and Stinger account for almost three quarters of our funding request with Patriot alone being about forty percent. Changes in scope from the Fiscal Year 1986 budget include multi-year procurements for Patriot and Stinger, procurement of a new generation Chaparral missile with Rosette Scan Seeker, reduction in production for Stinger, and advanced procurement for the line-of-sight forward heavy weapon.

Missile modifications include final procurement of the Chaparral Forward Looking Infrared night sight program, continuing the procurement of Phase III Ground Equipment upgrade for HAWK, optical improvements to TOW, Pre-planned Product Improvements for Patriot, new warheads for a part of the Dragon light antitank system missile inventory, and upgrades to components of the Lance Missile system to retain its nuclear capability into the future. For these modifications a total of $173.5M is being requested.

Patriot is an advanced surface-to-air guided missile system capable of operating in an electronic countermeasures environment. It uses a multi-function phased array radar to perform a variety of surveillance, acquisition, and guidance tasks in directing a battery of up to eight launchers armed with four ready missiles each. Nike-Hercules is being inactivated and Hawk is relocating as Patriot is deployed. The Army intends to procure a total program of 103 Patriot fire units and 6037 missiles.

During 1985 the Army completed fielding two Patriot battalions in Europe and activated a third battalion at Ft. Bliss, Texas. Patriot has performed beyond expectations in the field. Field operational availability has exceeded requirements by more than forty percent.

For Fiscal Year 1987, Patriot will enter its eighth year of production. This years' procurement request of $996.8M represents the first year of a five year multi-year proposal which will, if approved by the Congress, complete the buy out of the Patriot System and produce significant savings over single year procurement. We have already reduced the Patriot 5 year procurement program by over $300M to reflect the multi-year savings. In addition, our NATO allies will share additional savings, since the known Foreign Military Sales requirements which are included in the multi-year request will buy 12 fire units and 700 missiles.

Training of the soldier's military occupational specialty skills and collective training of the battalions continues at Fort Bliss, Texas. The Army is presently analysing all aspects of the present training program to ensure sufficient numbers of training equipment and devices are available to fully support the training mission for subsequent Patriot battalions designated for Europe and the Continental United States (CONUS).

Several nations are in advanced stages of procurement and deployment planning for the Patriot system. The Netherlands became the first NATO country to procure Patriot when they signed a Foreign Military Sales (FMS) agreement. The Dutch will procure four fire units. The first fire unit delivery is scheduled for spring 1986. One per year will follow until the program is complete.

In December 1983, the United States and Germany signed an agreement on cooperative measures for enhancing air defense for central Europe. An implementation agreement was signed in July 1984 and was recently approved by the United States Congress and the German Bundestag. The first deployment of a German system is anticipated to be in /deleted/. Further enhancement of this effort to improve Central Region Air Defense was recently achieved when the Germans concluded an FMS case with the United States to acquire fourteen additional Patriot fire units.

Japan has also selected Patriot to modernize its air defenses. The Japanese have formally approved an agreement for licensed production of 28 fire units.

The Multiple Launch Rocket System (MLRS) is currently in the full-scale production and deployment phases. The program is on schedule, within approved cost, and has achieved all established technical milestones. The Army takes great pride in the program's continued successful achievements.

The system is required to supplement the cannon artillery available to division and corps commanders and satisfies an urgent need in the fire support mission area. MLRS provides an all-weather, indirect fire system for delivery of devastating firepower, in less than one minute, against enemy artillery, air defense, and other light materiel and personnel targets, such as assembly areas and command posts. The system also has growth potential for the terminal guidance warhead, a scatterable antitank mine warhead, and a binary chemical warhead.

The MLRS is an international cooperative program. A Memorandum of Understanding (MOU) was signed with Germany, France, and the United Kingdom in July 1979. Italy was admitted as an associate member to the basic program in July 1982. The objective is to achieve required operational capabilities for participating nations while avoiding costly duplicative programs; the program is progressing satisfactorily.

The MLRS entered the Army on schedule. The first tactical battery was operational in March 1983 with Fort Riley's 1st Infantry Division. The first European battery was deployed in September 1983 to the 8th Division in Baumholder, Germany. We have fielded sixteen batteries thus far and expect to field a total of nine batteries in FY 86 and six in FY 87.

Fiscal Year 1986 was the fourth year of procuring major items under the multi-year contract awarded in September 1983.

The 1987, fifth year, procurement request is for $484.7M. The majority of these dollars is to fund 72,000 tactical rockets, 3,948 practice rockets, and 44 launchers to support deployments. A significant portion of the Fiscal Year 1987 request will be used to procure breakout hardware. 46,368,000 M77 submunitions will be procured by the government and provided to the prime contractor as Government Furnished Property. Also, the carrier vehicles will continue to be procured by Tank and Automotive Command and provided to the MLRS prime contractor as GFP.

The 1987 request also contains $10.5M for initial spares. The technical data package came under government control in July 1983, providing the first opportunity for breakout of major components and spare parts from the prime contractor. Since that time, the Army screened the data package to identify those components which can be broken out. Because of the multi-year contract with the prime contractor, additional major item breakout other than those already in being, the munitions and carriers, would not be economical. However, efforts are being applied to break out procurement of spare parts to the greatest extent feasible.

Our acquisition strategy and past performance clearly demonstrate that the Army will procure, field, and support the MLRS program at an affordable cost, a cost less than that presented to the Congress at the start of the program in 1976.

In addition, a contract was signed on 29 November 1984 with MDTT Joint Venture for development of the terminal guidance warhead (TGW). This is the first co-developed weapons system for the Army. Our partners are the United Kingdom, France, and Federal Republic of Germany. MDTT consists of Martin Marietta, of the United States, Thorn EMI, of the UK, Brandt Armements, of France, and Diehl, of Germany. The system is in Component Demonstration and the US pays 40 percent of the costs while each European partner pays 20 percent.

Your past support has provided the opportunity to develop and start procurement of this urgently required capability. The units in the field are now seeing the results of our efforts, and they are pleased. Your continued support is requested to keep these successful programs on schedule and under cost.

Pershing II is an evolutionary modernization of the Pershing Ia. Pershing II provides vastly improved performance: increased range /deleted/; higher accuracy /deleted/; use of lower yield warheads, thereby reducing collateral damage and civilian casualties; increased versatility through the use of the air-burst/surface-burst /deleted/; and superior military effectiveness and survivability. The Pershing II includes an improved maneuverable reentry vehicle which incorporates radar terminal guidance, new propulsion sections to achieve longer range, and ground support equipment changes that provide enhanced system reliability, accuracy, and targeting flexibility.

Since the Initial Operational Capability for the system was achieved in Germany in December 1983, we have successfully completed deployment. All three PII battalions in USAREUR and the battalion at Fort Sill, Oklahoma had reached final operational capability (FOC) on or before 31 January 1985. This accomplishment was made possible by the combined efforts of thousands of soldiers and civilians. The fielding of this highly technical missile system could not have been so successfully accomplished without the support of your Committee. Fielding of the system was not without mishap. On 11 January 1985, a first stage rocket motor ignited and burned during routine assembly training operations. This incident was tragic in itself because three soldiers were killed, but it did surface the need for several modifications. Production was halted immediately until a determination of the accident's cause could be made. When a U.S. Army safety investigation team determined the cause to be electrostatic discharge, modifications were made to all subsequently produced rocket motors. Those rocket motors fielded prior to the accident were modified in Europe. The final report about the accident was briefed to German Government officials on 15 January 1986, in Germany. No adverse feedback has been noted from this briefing.

Before turning to the specifics of our Fiscal Year 1987 request, I would like to update the Committee on results of our engineering development program. Three 2-stage missiles were successfully launched at Cape Canaveral, Florida in December 1985. Three single stage missiles were successfully launched at White Sands Missile Range in February 1986. These six firings were accomplished using all modifications applied due to the January 1985 accident, and were fired by soldiers from the three European deployed Pershing II battalions.

In Fiscal Year 1987, we are requesting $31.8M for procurement of Missile Flight Instrumentation Kits, Heavy Duty Material Handling Equipment, and protective covers for unassembled missile sections while in transit. Missile procurement was completed with the FY 86 buy of /deleted/ missiles. Final delivery of the total /deleted/ missiles procured will take place in 1987.

The TOW is the Army's heavy antiarmor/assault weapon system. It consists of a launcher, missile guidance set, day and night sights, and ground support equipment for maintenance, test, and training. TOW is capable of operation from the ground, vehicles, and helicopters for effective performance against tanks, fortifications and other targets. Important features include mobility and simplicity of operation. The ground launcher can be hand carried for short distances by a four man crew, and firing positions can be changed to minimize detection or to engage targets that are not within range. The system can engage targets in all battlefield conditions in which the target can be seen by the operator using either an optical or thermal imaging night sight. Our fly-to-buy program reflects the quality of this missile with a 94 percent reliability. In addition, our shelf-life test program where we take random samples from the older lots and fire them, gives us a 93 percent reliability.

The TOW is deployed, or is planned to be deployed in infantry, light infantry, mechanized infantry, antitank, air assault, airborne, armoredcavalry, Bradley, and COBRA/TOW units. In addition, TOW augments the M1 tank units in antiarmor defense at distances outside the ranges of the M1's cannon.

In January 1985, the TOW production line reopened after being closed to correct quality control problems. Since then the Army has accepted approximately 19,000 TOW 2 missiles. The TOW 2 has now been fielded to units in Europe, Korea, and Panama.

In Fiscal Year 1986, $195.7M in procurement was appropriated to procure 12,700 TOW 2 missiles and associated ground support equipment, as well as $22.0M in long-lead time items for the surge program. In addition, it is also planned to buy 251 launcher modification kits and 627 night sights for the Army.

In Fiscal Year 1987, we request authority to procure 12,000 TOW 2 missiles, which will require $150.1M. This will include $15.5M for surge. The long-lead time parts in the surge program will allow us to surge to 3,500 missiles a month and sustain that rate when directed in case of national emergency.

Stinger is the Army's shoulder fired, manportable air defense system that provides combat units protection against air attack throughout the battle area. Stinger uses a passive infrared homing seeker to guide on the target. The system replaces the aging Redeye, which was initially fielded in 1966. It provides a great improvement over the Redeye system by providing a capability to engage targets from all angles, at greater range, and uses an electronic means of identification (identification Friend of Foe system). Stinger was initially fielded in 1981. Stinger-POST (Passive Optical Seeker Technology), a product improvement that completed development in Fiscal Year 1983, improves the capability of the system in certain infrared countermeasures environments. Stinger-POST will initially be fielded in the fourth quarter of Fiscal Year 1987. Stinger-Reprogramable Microprocessor (RMP) is a further improvement that will provide the capability to make future changes as the threat evolves through a replaceable software module. Development of the RMP began in September 1984.

By the end of Fiscal Year 1986, 1061 Stinger teams, of a total of 3144 planned, will be deployed. A Stinger team consists of two men with six missiles. Teams have been deployed to Europe, Korea, Rapid Deployment Forces, and one National Guard Battalion (Roland).

The Fiscal Year 1985 procurement of 2,360 missiles are being procured in the RMP configuration. Initial deliveries of the RMP configured missile will begin in July 1987 with Stinger-POST internal software and without the software module. The software module will subsequently be delivered and the missile will complete the RMP upgrade in January 1988.

Our Fiscal Year 1987 request includes a 5 year multi-year program which saves $162M before negotiations with General Dynamics. The FY 87 request for $292.0M is to buy 4,180 Stinger-POST/RMP missiles. Deliveries begin in April 1989 at a rate of 525 missiles per month. This supports Army and Marine Corps requirements. Ground Support Equipment includes gripstocks, missiles containers, tracking head trainers, recharging coolant units, battery chargers, transport harnesses, IFF programmers, field handling trainers and Stinger launch simulators. In addition, $42.9M is included for the procurement of a non-developmental item called Pedestal Mounted Stinger (PMS).

PMS will be a Stinger based missile system with eight ready to fire missiles mounted on a high mobility multipurpose wheeled vehicle (HMMWV). The PMS is intended to solve the man-machine interface problems associated with Stinger, improve firepower, and speed reaction time for the Stinger gunner. A competitive test to select which non-developmental candidate will be procured is scheduled for August to November 1986. The source selection/production start is scheduled for February 1987 with the first unit equipped in FY 88.

Chaparral, one of the Army's Short Range Air Defense (SHORAD) missile systems, was first fielded in 1969 and will remain in the inventory through the 1990's, in support of the active Army and Army National Guard. Chaparral is a key element in the modernization of air defense units of the National Guard and is planned to replace Korean War vintage "Dusters" (twin 40mm), in four National Guard air defense battalions. Chaparral provides air defense protection for our forward maneuvering forces, Corps and Theater rear area assests, to include point air defense for key U. S. Air Bases in Europe. To keep Chaparral current against the threat, an ongoing product improvement program has been developed to improve system performance, operability, reliability and maintainability.

The Chaparral product improvement program includes development of the Rosette Scan Seeker (RSS) which provides increased countermeasures performance, a night and adverse weather capability by the addition of Forward Looking Infrared (FLIR) night sight, increased crew survivability by incorporation of a smokeless rocket motor, and a nuclear, biological and chemical (NBC) collective protection for the system and crew. The system reliability and maintainability are being upgraded by the addition of a diesel power supply, improved equipment cooling, and new master control pannel. The product improvement programs will extend the life of the Chaparral into the 1990's by providing a modern, reliable, and effective system.

The FY 87 request for $105.6M will procure the initial 456 RSS missiles, 524 smokeless rocket motors, and optical improvements for the FLIR night sight.

The Hellfire is a laser guided antitank missile capable of employment both in direct and indirect fire modes. It is mounted on our Apache attack helicopter. Targets can be laser designated by the launching Apache, another Apache or scout helicopter, or by a ground laser designator. The flexibility offered by Hellfire increases Apache survivability and at the same time provides for high kill rates of enemy armored vehicles.

20,832 missiles will have been procured through Fiscal Year 1986. Hellfire is scheduled to be fielded on the Apache in the third quarter of Fiscal Year 1986 - the fifth year of production for the missile. In Fiscal Year 1986, $225.9M was appropriated to procure a minimum of 5750 missiles.

No procurement request was submitted in 1987 to procure missiles due to production delays.

The Army has initiated a program called Forward Area Air Defense to fill the void left when the Secretary of Defense cancelled the SGT YORK program. The program consists of several parts, and one of the parts, the Line-of-Sight-Forward (heavy), requires procurement dollars in 1987. The Line-of-Sight Forward (heavy) weapon will be employed in the close combat zone to kill and suppress enemy fixed wing and exposed rotary wing aircraft. A gun/missile mix is envisioned as the system configuration for this weapon. Guns are most effective at short ranges where they can produce quick reaction, high volume fire. Missiles can reach out better at longer ranges and react to maneuvering aircraft. The mix is considered the most effective against todays threat and provides growth potential as the threat evolves.

A request for information (RFI) has already been released to solicit information from industry on solving the Line-of-Sight Forward problem. A Non-Developmental Item (NDI) acquisition strategy is planned. Weapon demonstration is planned in the fall of 1986 to verify and collect data. System selection is scheduled for March 1987. The request for $9.1M is to procure long-lead items for low rate initial production which is scheduled to begin in FY 88. An IOC could be attained as early as 1990. Your support is required to get this program off to a successful start.

## OVERVIEW—OTHER PROCUREMENT

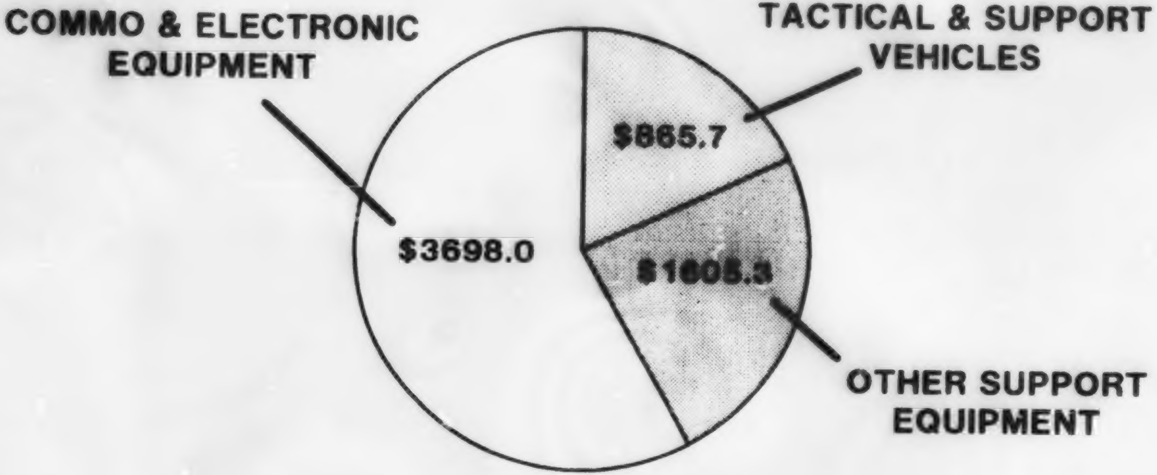
General **THOMAS**. Thank you very much, Mr. Chairman. It is a pleasure to be here today to testify on behalf of the Other Procurement account for the Army.

[Slides follow:]

# **O** THER **P** ROCUREMENT **A** RMY

- TACTICAL & SUPPORT VEHICLES
- OTHER SUPPORT EQUIPMENT
- COMMUNICATIONS-ELECTRONICS

# OTHER PROCUREMENT ARMY
## ($ IN MILLIONS)

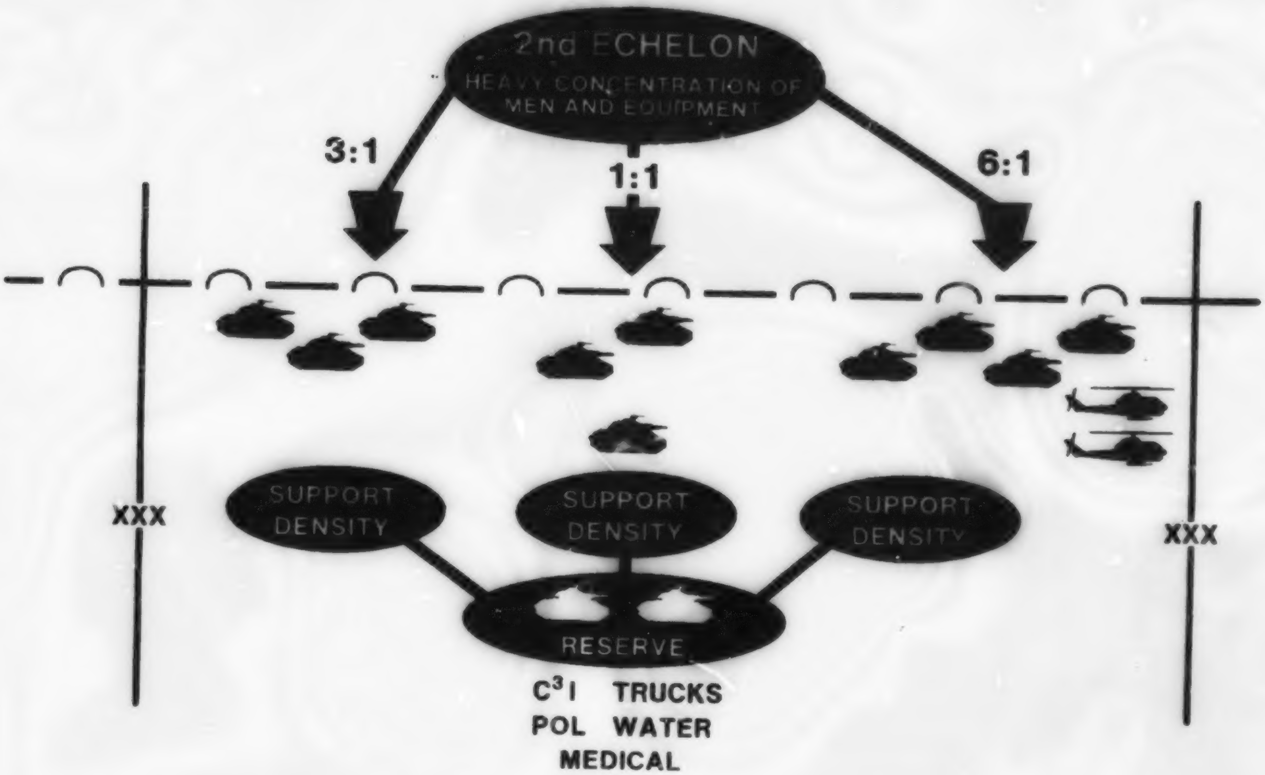


FY 87 $6169.0 MILLION

General **THOMAS**. In the Other Procurement account for the Army, this year's request totaled approximately $6.2 billion, reflecting communication and electronic equipment, tactical wheeled vehicles and other support equipment. This is a significant request and we would like to take just a moment to explain.

This year's OPA account was a conscious effort by the Army to balance the force, and I think that is extremely important in our balancing the force with respect to the conduct of the battle and winning in that battle.

[Slide follows:]



2nd ECHELON

HEAVY CONCENTRATION OF
MEN AND EQUIPMENT

3:1

1:1

6:1

XXX

XXX

SUPPORT
DENSITY

SUPPORT
DENSITY

SUPPORT
DENSITY

RESERVE

C³I TRUCKS
POL WATER
MEDICAL

General THOMAS. This chart depicts a corps as seen in the perspective of the crops commander facing an enemy with three avenues of approach, one with a ratio outnumbered six to one, one at theree to one, and one at one to one.

The weapons systems which we have been buying and are continuing to buy are arrayed so that most are on the most threatening attack and the least on the least threatening avenue of approach.

You can see the artillery lined up in support density. The key here is to be able to commit the reserve and move those forces about the battlefield. That requires the $C^3I$, the trucks, the POL, the water, and the medical equipment in order to position the forces where they are required on the battlefield.

The second echelon is postured to follow any one of those three attacks. It can go anywhere from the left to the right or to the middle.

Our concern is having the Other Procurement Army account postured so that we can take advantage of weapon systems that we are buying.

Next chart please.

[Slide follows.]

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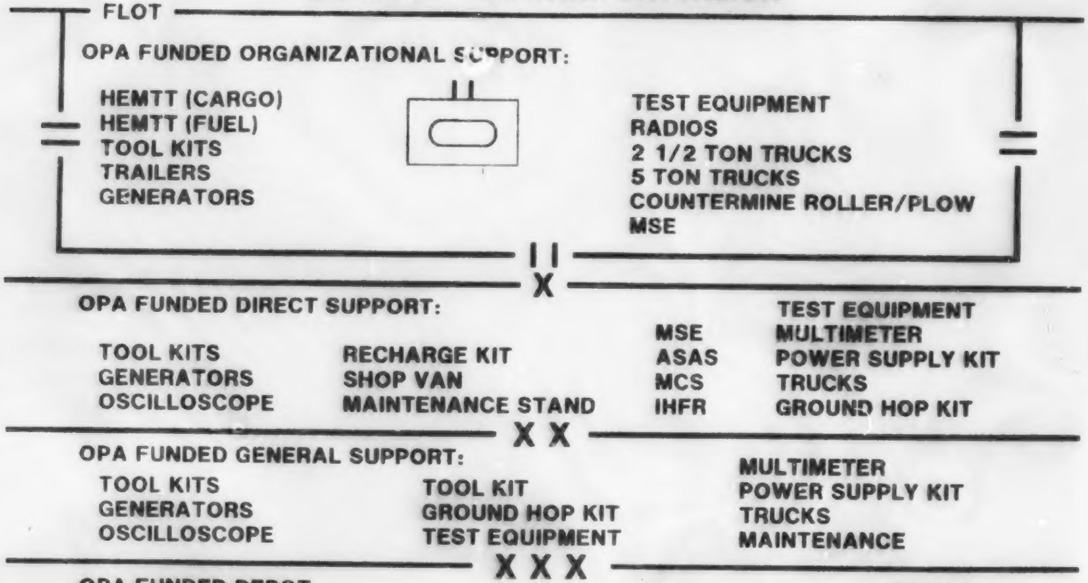
# OPA

## EXAMPLE - M1 TANK BATTALION



**OPA FUNDED ORGANIZATIONAL SUPPORT:**

HEMTT (CARGO)
HEMTT (FUEL)
TOOL KITS
TRAILERS
GENERATORS

TEST EQUIPMENT
RADIOS
2 1/2 TON TRUCKS
5 TON TRUCKS
COUNTERMINE ROLLER/PLOW
MSE

**OPA FUNDED DIRECT SUPPORT:**

TOOL KITS
GENERATORS
OSCILLOSCOPE

RECHARGE KIT
SHOP VAN
MAINTENANCE STAND

MSE
ASAS
MCS
IHFR

TEST EQUIPMENT
MULTIMETER
POWER SUPPLY KIT
TRUCKS
GROUND HOP KIT

**OPA FUNDED GENERAL SUPPORT:**

TOOL KITS
GENERATORS
OSCILLOSCOPE

TOOL KIT
GROUND HOP KIT
TEST EQUIPMENT

MULTIMETER
POWER SUPPLY KIT
TRUCKS
MAINTENANCE

**OPA FUNDED DEPOT:**

TEST STANDS
AUTOMATIC TEST EQUIPMENT

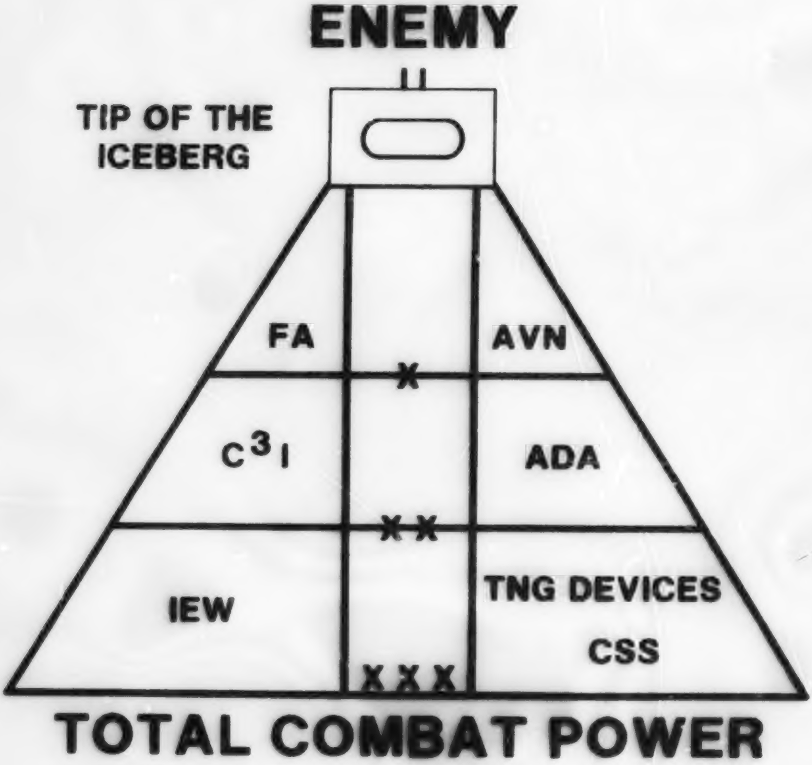
OTHER DMPE
OTHER DMPE

☐ OPA 1
☐ OPA 2
☐ OPA 3

General THOMAS. As an example, a tank battalion is supported by the HEMTT cargo and fuel trucks, tool kits, trailers, generators, test equipment, radios, trucks, et cetera. That is backed up with support at the division level of the same equipment and other OPA items and at the corps level—all that backup is required to make one tank battalion effective in combat.

Next slide please.

[Slide follows:]


ENEMY
TIP OF THE ICEBERG
FA
AVN
C³I
ADA
IEW
TNG DEVICES
CSS
TOTAL COMBAT POWER

General **Thomas**. Looking at total combat, we see that battalion is really the tip of the iceberg. That battalion, be it an M1 battalion, a Bradley battalion, et cetera, requires the field artillery to support it, the aviation, the air defense, the engineers and each one of those is supported by the Other Procurement Army account.

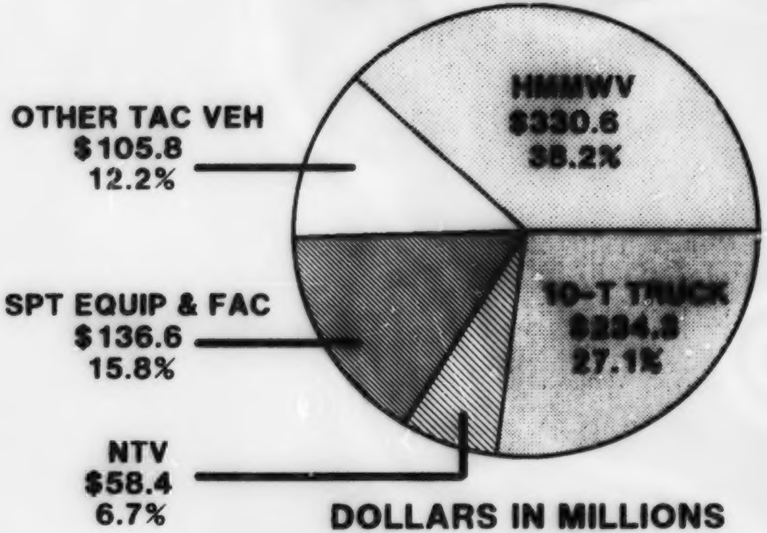
So the collective combat power requires the support of the Other Procurement Army account.

[Slide follows:]

59-619 O—86——4

# OTHER PROCUREMENT, ARMY
# TACTICAL & SUPPORT VEHICLES

FY 87 TOA = $865.7



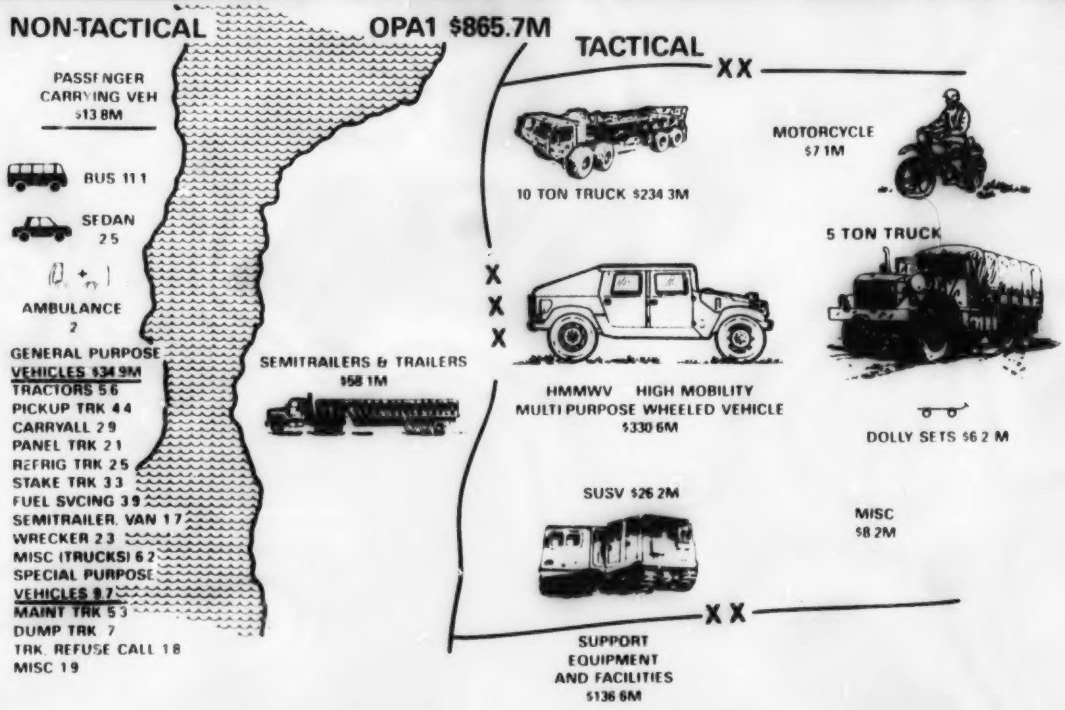
DOLLARS IN MILLIONS

## TACTICAL AND SUPPORT VEHICLES

General THOMAS. In looking at the first activity, tactical and support vehicles, you will note that the majority of the request is for the HMMWV and the ten-ton truck. You will also note that there is no request for five-ton money this year. This is something we did because of the fact that we have prior years; money that can be applied to the new multi-year contract and we did not have to request moneys this year for that program.

[Slide follows:]

# VEHICLES



## NON-TACTICAL

OPA1 $865.7M

## TACTICAL

PASSENGER
CARRYING VEH
$13 8M

BUS 11 1

SEDAN
2 5

AMBULANCE
2

GENERAL PURPOSE
VEHICLES $34 9M
TRACTORS 5 6
PICKUP TRK 4 4
CARRYALL 2 9
PANEL TRK 2 1
REFRIG TRK 2 5
STAKE TRK 3 3
FUEL SVCING 3 9
SEMITRAILER, VAN 1 7
WRECKER 2 3
MISC (TRUCKS) 6 2
SPECIAL PURPOSE
VEHICLES 9 7
MAINT TRK 5 3
DUMP TRK 7
TRK, REFUSE CALL 1 8
MISC 1 9

SEMITRAILERS & TRAILERS
$58 1M

10 TON TRUCK $234 3M

MOTORCYCLE
$7 1M

5 TON TRUCK

HMMWV HIGH MOBILITY
MULTI PURPOSE WHEELED VEHICLE
$330 6M

DOLLY SETS $6 2 M

SUSV $26 2M

MISC
$8 2M

SUPPORT
EQUIPMENT
AND FACILITIES
$136 6M

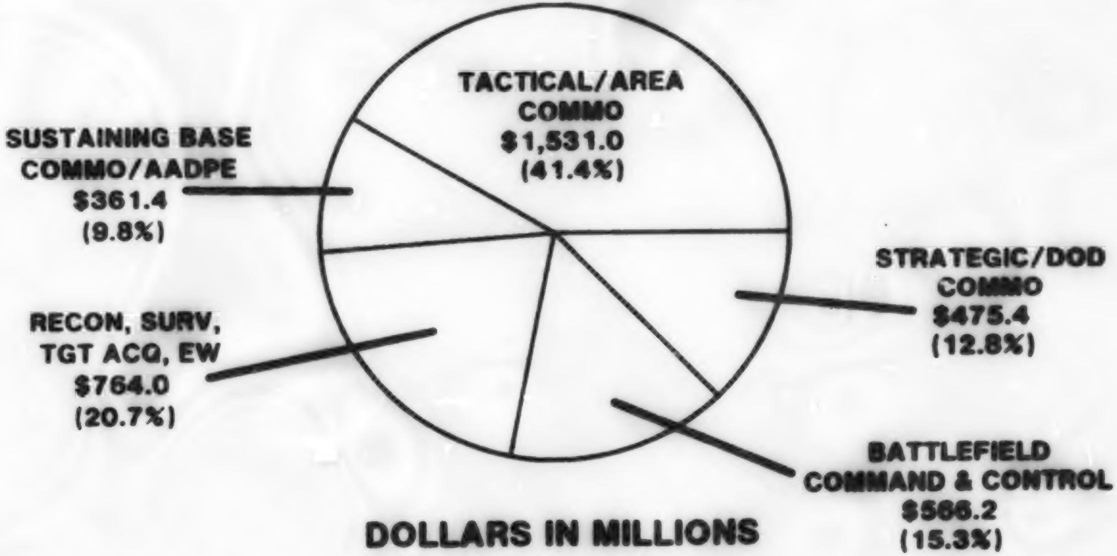
General THOMAS. The next slide shows the distribution of this equipment on the battlefield, where it is located, what the cost of it is, and the supporting transportation network from the CONUS sustaining base and across the ocean to the echelons above Corps and down into the units.

That is a transportation network system that needs to be balanced and we are trying to do that.

[Slide follows:]

# OTHER PROCUREMENT, ARMY
# COMMUNICATIONS & ELECTRONICS EQUIPMENT

FY 87 TOA = $3,698.0



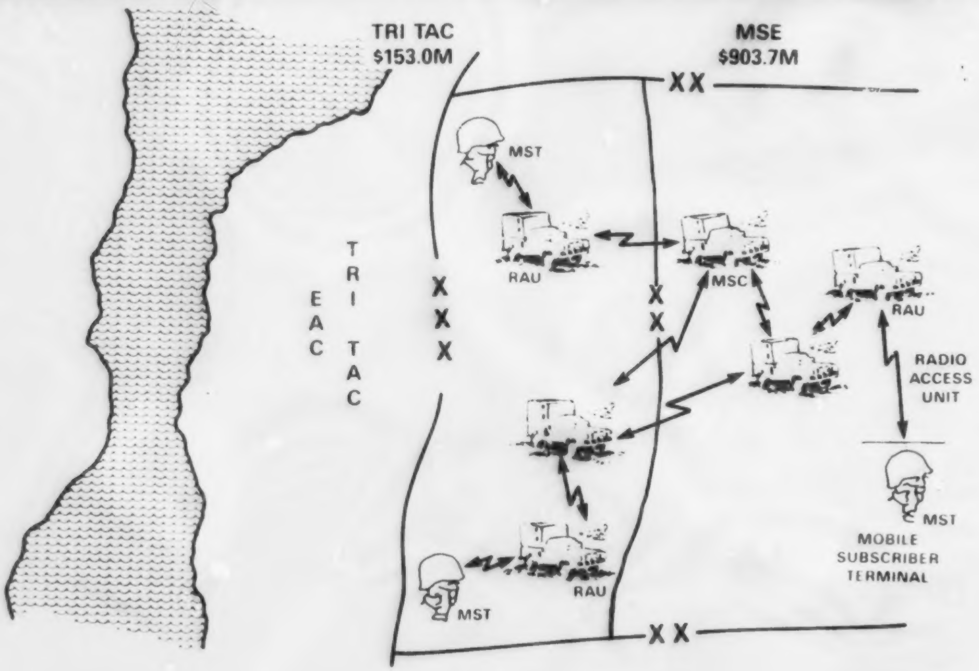
DOLLARS IN MILLIONS

### COMMUNICATIONS AND ELECTRONICS

General THOMAS. The next slide is OPA II activity for communications and electronics. You will note the major area is the tactical area of communications. This is one of our growing accounts. This is the $C^3I$ required to synchronize that combat power and put it where it must be on the battlefield so that the weapons systems we are buying are not left on the side line of the next war.

[Slide follows:]

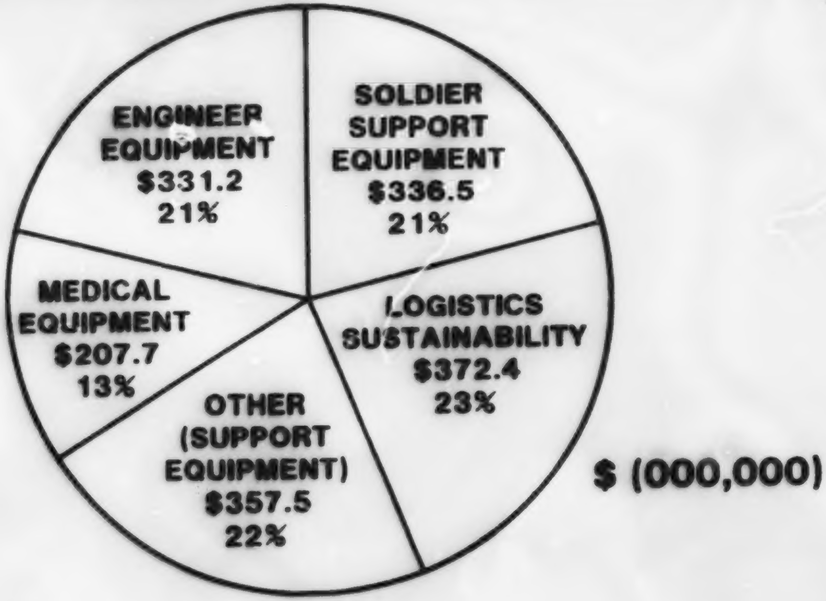
# TACTICAL/AREA COMMUNICATIONS


TRI TAC
$153.0M
MSE
$903.7M
XX
MST
RAU
MSC
RAU
EAC
TRI TAC
XXX
XX
RADIO ACCESS UNIT
RAU
MST
MST
MOBILE SUBSCRIBER TERMINAL
XX

General **Thomas**. This reflects just a few activities in that account, mobile subscriber request, for the total corps C³I communications for the corps and division down to include the brigade and battalion commanders and echelon above corps TRITAC equipment.

[Slide follows:]

# OTHER PROCUREMENT, ARMY
# OTHER SUPPORT EQUIPMENT
# FY 87 TOA = $1,605.3M



General **Thomas**. In turning to the OPA III account, that includes our soldier support equipment, chemical defense equipment, our mess equipment for feeding the troops, POL and water support equipment, engineer equipment and non-systems training devices. These are very critical to our success on the battlefield.

# SUPPORT SYSTEMS

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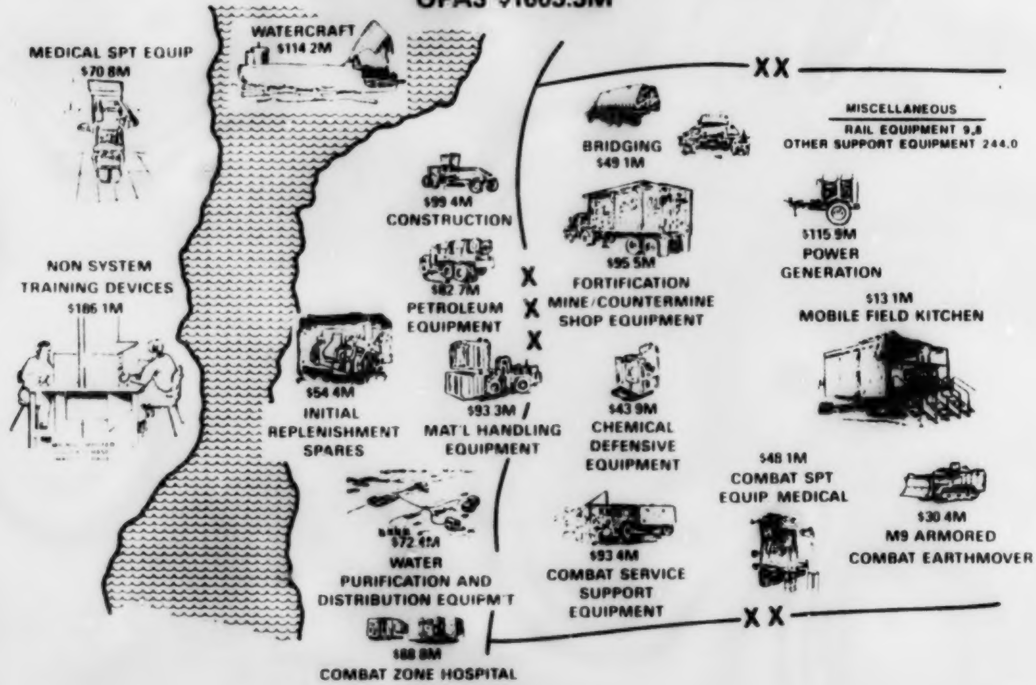
## OPA3 $1605.3M



MEDICAL SPT EQUIP
$70 8M

WATERCRAFT
$114 2M

NON SYSTEM
TRAINING DEVICES
$186 1M

$99 4M
CONSTRUCTION

$82 7M
PETROLEUM
EQUIPMENT

$54 4M
INITIAL
REPLENISHMENT
SPARES

$93 3M
MAT'L HANDLING
EQUIPMENT

$72 4M
WATER
PURIFICATION AND
DISTRIBUTION EQUIPM'T

$88 8M
COMBAT ZONE HOSPITAL

XX

BRIDGING
$49 1M

$95 5M
FORTIFICATION
MINE/COUNTERMINE
SHOP EQUIPMENT

$43 9M
CHEMICAL
DEFENSIVE
EQUIPMENT

$93 4M
COMBAT SERVICE
SUPPORT
EQUIPMENT

MISCELLANEOUS
RAIL EQUIPMENT 9.8
OTHER SUPPORT EQUIPMENT 244.0

$115 9M
POWER
GENERATION

$13 1M
MOBILE FIELD KITCHEN

$48 1M
COMBAT SPT
EQUIP MEDICAL

$30 4M
M9 ARMORED
COMBAT EARTHMOVER

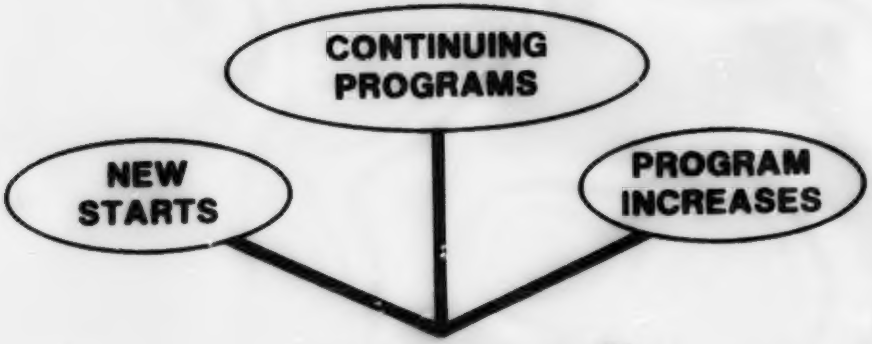
XX

General **Thomas**. The next slide shows where these are located on the battlefield, the types of systems, as you will note, and the amount of dollars for each, from bridging to the M9 ACE, combat support, medical equipment and including medical equipment on the battlefields and fixed hospitals around the world. One of our growing accounts is non-systems training devices, which help us to train better and offset some of the training required with the real items.

Next slide please.

[Slide follows:]

# OPA
# 14% REAL GROWTH
## FY86 - FY87



CONTINUING PROGRAMS

NEW STARTS

PROGRAM INCREASES

MODERNIZATION
SUSTAINABILITY
READINESS

NOT MUTUALLY EXCLUSIVE

General **Thomas**. As I have stated, there is a 14 percent growth this year in the Other Procurement Army account. We recognize that and that was a conscious decision on our part, the Army's leadership part, to balance the force between combat vehicles and weapons systems and the ability to make sure that they are in the right place on the battlefield and are sustained.

### MODERNIZATION

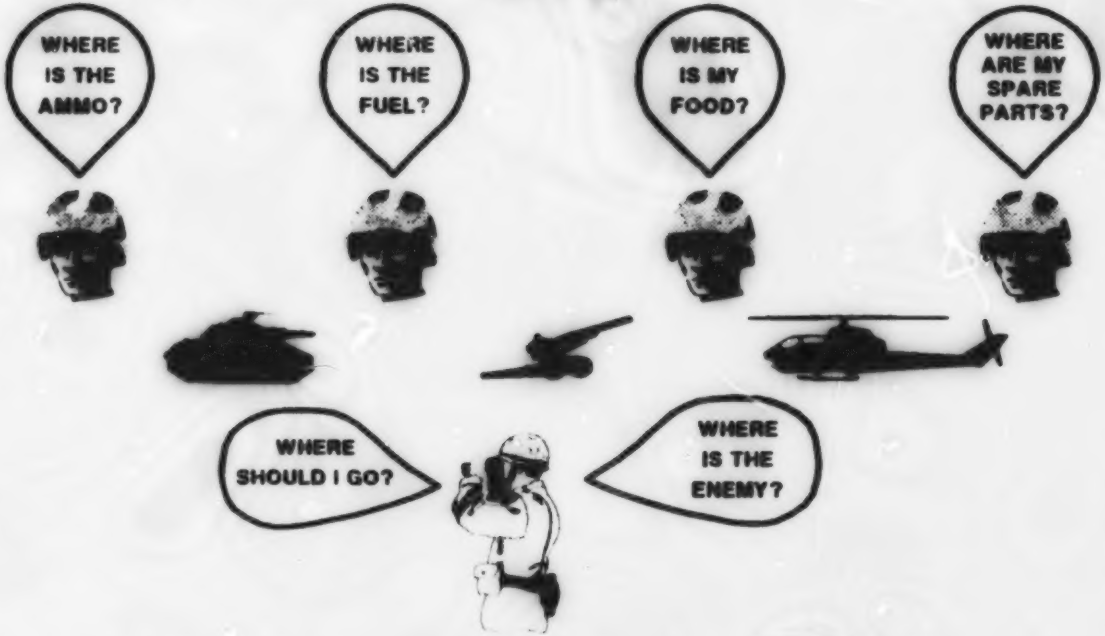
This encompasses some new starts, continuing programs and program increases we feel are key to the modernization, sustainment and readiness of the Army, and that are mutually supportive, not mutually exclusive.

The reason we are not buying any more VRC-12s, although we are short radios, is that we are putting those dollars into the SINCGARS account. We are not buying old trucks. We are buying new trucks even though we are short.

So regarding modernization and readiness, we feel we are doing that in a mutually supportive manner.

[Slide follows:]

# OPA


WHERE IS THE AMMO?
WHERE IS THE FUEL?
WHERE IS MY FOOD?
WHERE ARE MY SPARE PARTS?
WHERE SHOULD I GO?
WHERE IS THE ENEMY?

OPA MEANS - NEVER HAVING TO SAY WHERE?

General **Thomas**. The next chart sort of sums up what we feel OPA is. Other Procurement Army means not having to say where, where is the ammo, where is the fuel, where is my food or spare parts, and most importantly, where is the enemy and where should I be.

Our balancing of force we feel is key to ensuring you don't have to ask those questions and that we not only make the best use of the combat weapon systems we are buying, but that we also provide what is necessary for the young men and women of America that are serving for us.

Thank you very much.

[The statement of General Thomas follows:]

STATEMENT BY BRIGADIER GENERAL BILLY M. THOMAS, USA

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE, IT IS A PLEASURE TO PROVIDE YOU A SUMMARY OF THE OTHER PROCUREMENT, ARMY (OPA) APPROPRIATION BUDGET REQUEST FOR FY 87. THE ARMY HAS A CLEAR VISION OF THE GOALS IT MUST ACHIEVE IN ORDER TO DETER WAR, AND, IF NEED BE, TO FIGHT AND WIN. OUR ANALYSIS OF THESE GOALS HAS PROVIDED US WITH THE CRITICAL TASKS AND KEY OPERATIONAL CAPABILITIES WE MUST ACCOMPLISH.

FOR EXAMPLE, SYNCHRONIZATION ON THE BATTLEFIELD THROUGH MODERNIZATION OF OUR $C^3I$ SYSTEMS AND MODERNIZATION OF OUR BATTLEFIELD SUSTAINMENT CAPABILITY ARE TWO OF OUR CRITICAL TASKS. ALSO, ENHANCEMENT TO SOLDIER AND UNIT PERFORMANCE THROUGH THE USE OF ADDITIONAL TRAINING SIMULATION DEVICES, MODERNIZED CHEMICAL PROTECTION EQUIPMENT, AND THE NEW FIELD FEEDING EQUIPMENTS IS REQUIRED SUPPORT OUR OBJECTIVES. I MENTION THESE THINGS BECAUSE IT'S EASY TO LOSE SIGHT OF OUR ULTIMATE PURPOSE AND GET LOST IN THE MAZE OF INDIVIDUAL BUDGET LINE ITEMS CLEARLY ASSOCIATED WITH THE CATCH ALL TITLE OF "OTHER PROCUREMENT-ARMY".

THE OTHER PROCUREMENT APPROPRIATION IS MORE THAN JUST TRUCKS AND COMMUNICATION-ELECTRONICS EQUIPMENT. IN OUR EFFORTS TO ACHIEVE A BALANCED FORCE, WE CAREFULLY ANALYZED OUR EFFECTIVENESS AND SUSTAINABILITY ON THE AIRLAND BATTLEFIELD. WE EXAMINED THE BALANCE BETWEEN COMBAT WEAPONS SYSTEMS AND THE OPA SUPPORT EQUIPMENT REQUIRED TO EXPLOIT THE FULL RANGE OF CAPABILITIES. TANKS, ARTILLERY, AND HELICOPTERS ARE ALL VITALLY IMPORTANT TO US. HOWEVER, THESE COMBAT SYSTEMS AND THEIR SOLDIERS MUST BE SUPPORTED WITH AMMUNITION, GAS, FOOD, SPARE PARTS, CLOTHING AND PROTECTION IN A CHEMICAL ENVIRONMENT. ADDITIONALLY THESE COMBAT SYSTEMS MUST BE DIRECTED TO THE PROPER PLACE ON THE BATTLEFIELD LEST THEY SIT IDLE DURING THE FIGHT. THIS IS OPA - THE $C^3I$ TO PROPERLY EMPLOY THESE COMBAT SYSTEMS; THE TRUCKS TO PROVIDE THE AMMUNITION, GAS AND FOOD; THE CHEMICAL PROTECTION FOR OUR SOLDIERS; FEEDING SYSTEMS TO KEEP UP WITH THE FAST PACED BATTLE AND A MYRIAD OF OTHER SUPPORT ITEMS. ADDITIONALLY WE EXAMINED THE BALANCE U.S. BASED AND FORWARD DEPLOYED UNITS, ACTIVE AND RESERVE FORCES, AS WELL AS HEAVY AND LIGHT FORCES. THE REQUIREMENTS FOR THIS BALANCED FORCE HAVE BEEN TRANSLATED INTO OPA BUDGET LINES. THE OPA ITEMS DO NOT OFTEN RECEIVE A GREAT DEAL OF VISIBILITY, BUT ON THE OTHER HAND, THEY ARE MOST OFTEN THE ITEMS THAT MOST AFFECT UNIT READINESS AND THE ABILITY TO SYNCHRONIZE AND SUSTAIN THE MAXIMUM AMOUNT OF

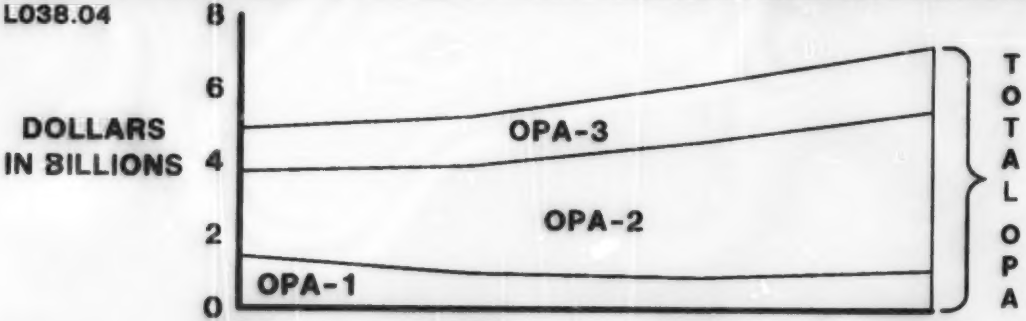
OFFSET
CAMERA COPY

COMBAT POWER ON THE BATTLEFIELD. THIS IS VITAL, PARTICULARLY WHEN WE ARE OUTNUMBERED.

IN THE CHARTS THAT FOLLOW, YOU WILL SEE THAT THE OTHER PROCUREMENT, ARMY APPROPRIATION IS GROWING AT A FASTER RATE THAN OTHER RDA ACCOUNTS. THE REASON IS CLEAR. WE HAVE CONSCIOUSLY PROGRAMED FUNDS TO ENHANCE OUR BATTLEFIELD EFFECTIVENESS AND SUSTAINABILITY, AND HAVE CONSCIOUSLY FOCUSED OUR RESOURCES TO PROCURE THE EQUIPMENTS WHICH ACCOMPLISH THESE OBJECTIVES.

THE FOLLOWING FIGURE AND TABLE SHOW THE DISTRIBUTION OF OPA FUNDS BY BUDGET ACTIVITY FOR FISCAL YEARS 1985 THROUGH 1988 AS PRESENTED IN THE FY 87 PRESIDENT'S BUDGET.

# OTHER PROCUREMENT ARMY
# FY 87 PRESIDENT'S BUDGET



| | FY85 | FY86 | FY87 | FY88 |
|---|---|---|---|---|
| OPA 1 | 1407.1 | 963.5 | 865.7 | 1072.8 |
| OPA 2 | 2320.1 | 2936.9 | 3696.0 | 4351.9 |
| OPA 3 | 1163.5 | 1339.9 | 1605.3 | 1765.2 |
| TOTAL | 4890.7 | 5240.3 | 6169.0 | 7189.9 |

FIGURE 1

TABLE 1
FY 1987 REQUEST BY BUDGET ACTIVITY

| ACTIVITY | TITLE | MILLIONS OF DOLLARS |
|---|---|---|
| 1 | TACTICAL & SUPPORT VEHICLES | 865.7 |
| 2 | COMMUNICATIONS & ELECTRONICS | 3,698.0 |
| 3 | OTHER SUPPORT EQUIPMENT | 1,605.3 |
| | TOTAL | 6,169.0 |

BUDGET ACTIVITY 1 (OPA 1), TACTICAL AND SUPPORT VEHICLES CONSISTS OF 34 BUDGET LINES FOR VARIOUS VEHICLES AND REPAIR PARTS. AS SHOWN IN THE FOLLOWING FIGURE, THE FY 87 OPA 1 REQUEST IS APPROXIMATELY $100 MILLION LESS THAN THE FY 86 OPA 1 FUNDED PROGRAM.

# OPA-1 TACTICAL & SUPPORT VEHICLES
## FY 87 PRESIDENT'S BUDGET

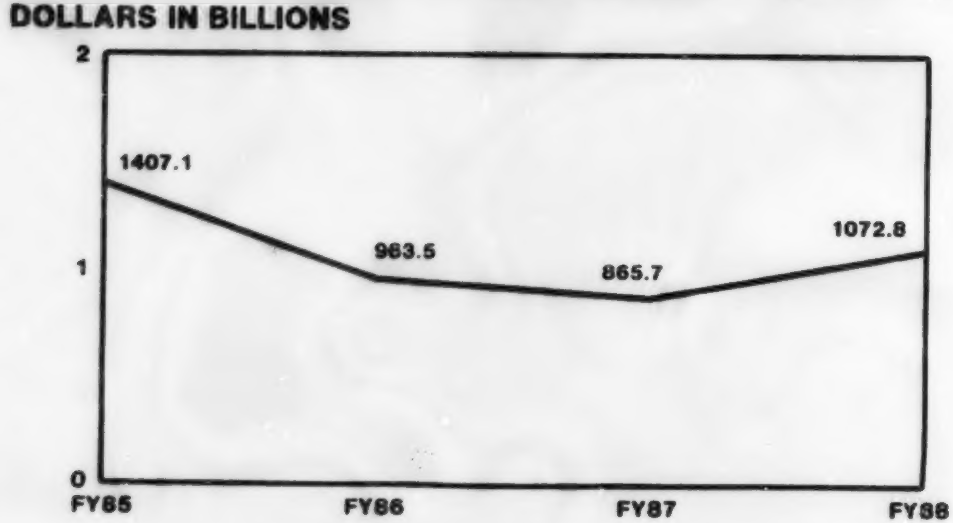


FIGURE 2

THIS DECREASE IS PRIMARILY THE RESULT OF THE UNAVOIDABLE DELAY IN THE AWARD OF NEW MULTIYEAR CONTRACT FOR THE 5 TON TRUCK. DUE TO THIS DELAY, IN THE INTEREST OF PRUDENT FINANCIAL MANAGEMENT, WE ARE NOT ASKING FOR ADDITIONAL FUNDS FOR THE 5 TON PROGRAM THIS YEAR. WE WILL BE USING OUR AVAILABLE FY 85 FUNDS TO MOVE OUT WITH THIS PROGRAM AND PLAN TO AWARD OUR NEW CONTRACT BY THE END OF APRIL 1986. THE FY 86 FUNDS WHICH YOU APPROPRIATED LAST YEAR WILL BE USED TO FUND DELIVERIES UNTIL FY 88 FUNDS ARE AVAILABLE.

DISTRIBUTION OF THE FY 86 ENTIRE OPA 1 PROGRAM BY MAJOR PROGRAM CATEGORY IS SHOWN IN THE FOLLOWING TABLE. FIGURE 3 SHOWS THE FUNDING FOR EACH OF THE KEY PROGRAMS.

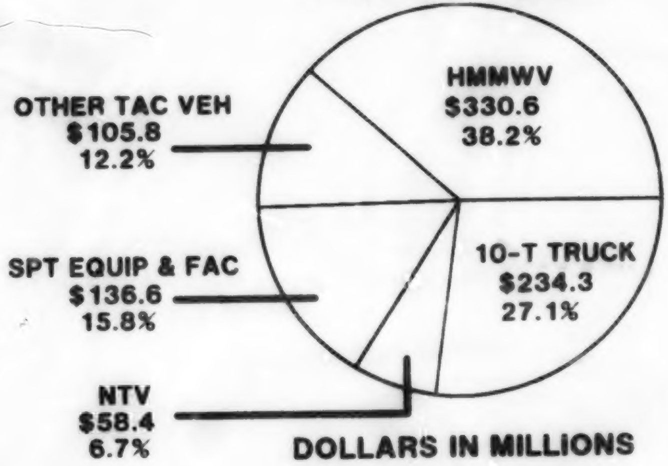
## TABLE 2

## BUDGET ACTIVITY 1
## TACTICAL AND SUPPORT VEHICLES
## FY 86 PRESIDENT'S BUDGET

| FUNCTIONAL AREA | MILLIONS OF DOLLARS |
|---|---|
| TACTICAL VEHICLES | 670.7 |
| NON-TACTICAL VEHICLES | 58.4 |
| SUPPORT EQUIPMENT AND FACILITIES | 136.6 |
| TOTAL | 865.7 |

# OTHER PROCUREMENT, ARMY TACTICAL & SUPPORT VEHICLES

FY 87 TOA = $865.7



DOLLARS IN MILLIONS

FIGURE 3

TRUCKS ARE NEEDED IN ARMY UNITS AROUND THE WORLD. THEY ARE THE MAINSTAY OF THE ARMY'S TRANSPORTATION MISSION. MOVING PEOPLE, SUPPLIES AND EQUIPMENT IS OF VITAL IMPORTANCE TO THE SUCCESS OF BOTH PEACETIME AND WARTIME MISSIONS.

THE FY 87 BUDGET REQUEST REFLECTS THE ARMY'S CONTINUING COMMITMENT TO UPGRADE OUR TRUCK FLEET. FUNDING FOR THE VARIOUS PROGRAMS IS SHOWN ON THE FOLLOWING FIGURE.

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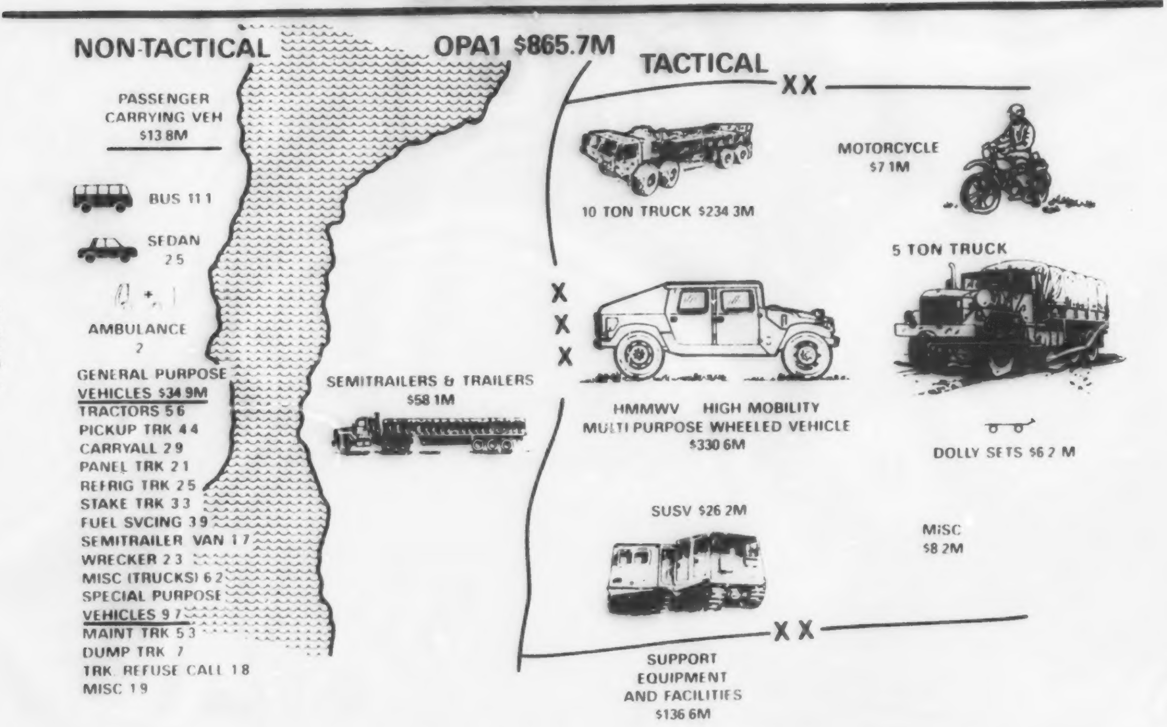
# VEHICLES



**NON-TACTICAL**

**OPA1 $865.7M**

**TACTICAL**

PASSENGER
CARRYING VEH
$13 8M

BUS 11 1

SEDAN
2 5

AMBULANCE
2

GENERAL PURPOSE
VEHICLES $34 9M
TRACTORS 5 6
PICKUP TRK 4 4
CARRYALL 2 9
PANEL TRK 2 1
REFRIG TRK 2 5
STAKE TRK 3 3
FUEL SVCING 3 9
SEMITRAILER VAN 1 7
WRECKER 2 3
MISC (TRUCKS) 6 2
SPECIAL PURPOSE
VEHICLES 9 7
MAINT TRK 5 3
DUMP TRK 7
TRK. REFUSE CALL 1 8
MISC 1 9

SEMITRAILERS & TRAILERS
$58 1M

XX

10 TON TRUCK $234 3M

MOTORCYCLE
$7 1M

XXX

5 TON TRUCK

HMMWV HIGH MOBILITY
MULTI PURPOSE WHEELED VEHICLE
$330 6M

DOLLY SETS $6 2 M

SUSV $26 2M

MISC
$8 2M

XX

SUPPORT
EQUIPMENT
AND FACILITIES
$136 6M

FIGURE 4

IN FY 87 WE WILL PROCURE HMMWVS, 10 TON TRUCKS, SUSVS, AND MOTORCYCLES AS WELL AS TRAILERS, SEMITRAILERS AND DOLLY SETS. ADDITIONALLY, WE WILL PROCURE THE TACTICAL AND SUPPORT VEHICLES SUCH AS SEDANS, BUSES, AMBULANCES, PICKUPS, CARRYALLS AND A VARIETY OF MAINTENANCE AND SERVICE TRUCKS REQUIRED FOR OPERATIONS OF BASES WORLDWIDE.

WE ARE ALSO REQUESTING $136.6 MILLION FOR INITIAL AND REPLENISHMENT SPARE PARTS. THE FY 87 SPARE PARTS FUNDS WILL PROCURE DEPOT REPARABLE COMPONENTS (ENGINES, TRANSMISSIONS, TRANSFER CASES, AXLES, ETC.) REQUIRED TO SUPPORT OUR TACTICAL VEHICLE FLEET.

BUDGET ACTIVITY 2, COMMUNICATIONS AND ELECTRONICS EQUIPMENT, PROVIDES FOR TACTICAL/AREA COMMUNICATIONS, STRATEGIC/DOD COMMUNICATIONS AND AUTOMATION, SUSTAINING BASE COMMUNICATIONS AND AUTOMATION, BATTLEFIELD COMMAND AND CONTROL, AND RECONNAISSANCE, SURVEILLANCE, TARGET ACQUISITION AND INTELLIGENCE/ELECTRONIC WARFARE PROGRAMS. THE DISTRIBUTION OF FUNDS IS SHOWN ON TABLE 3 AND FIGURES 5 AND 6. INCLUDED IN EACH OF THESE CATEGORIES ARE THE REQUIRED SUPPORTING SPARES FOR THE INDIVIDUAL PROGRAMS.

## TABLE 3

## BUDGET ACTIVITY 2
## COMMUNICATIONS AND ELECTRONICS EQUIPMENT
## FY 87 PRESIDENT'S BUDGET

| FUNCTIONAL AREA | MILLIONS OF DOLLARS |
|---|---|
| TACTICAL/AREA COMMUNICATIONS | 1,531.0 |
| BATTLEFIELD COMMAND AND CONTROL | 566.2 |
| RECON, SURVEIL, EW, TARGET ACQ | 764.0 |
| STRATEGIC/DOD COMMUNICATIONS | 475.4 |
| SUSTAINING BASE COMMO/ADPE | 361.4 |
| TOTAL | 3,698.0 |

# OPA-2 COMMUNICATIONS & ELECTRONICS EQUIPMENT
## FY 87 PRESIDENT'S BUDGET

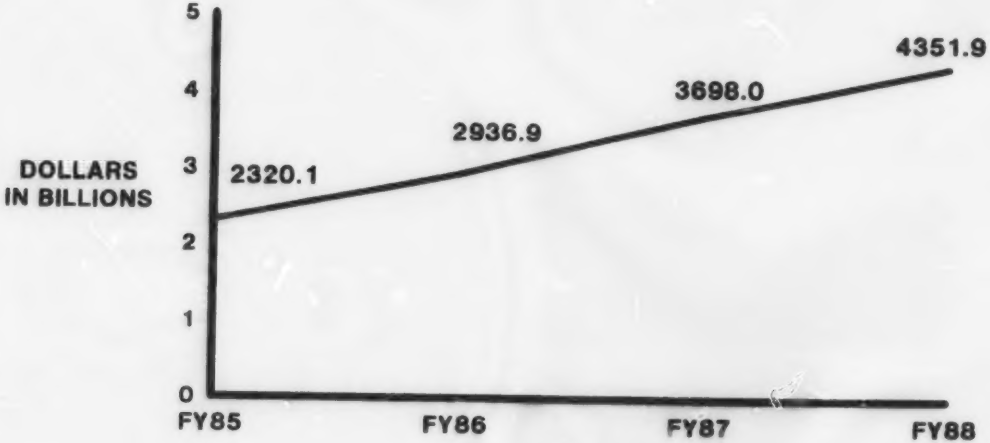


FIGURE 5

# OTHER PROCUREMENT, ARMY
# COMMUNICATIONS & ELECTRONICS EQUIPMENT

FY 87 TOA = $3,698.0

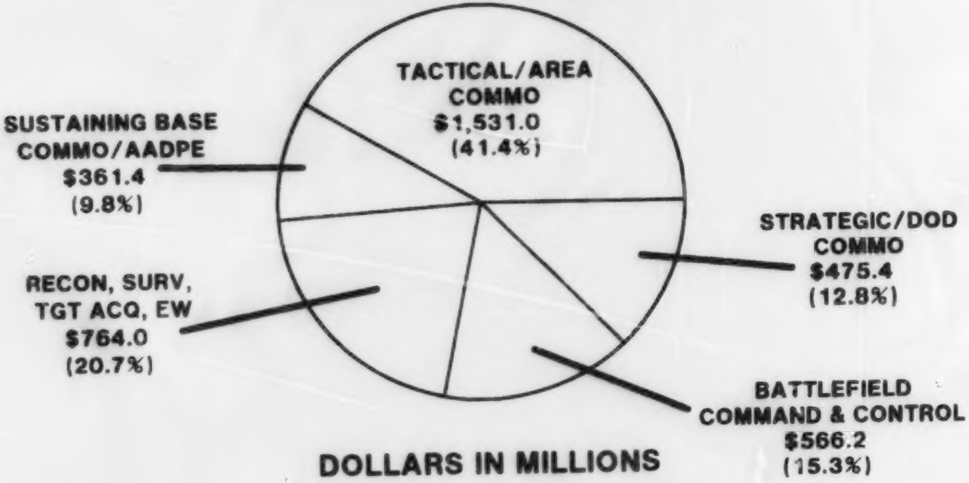


FIGURE 5

THE ARMY'S TACTICAL/AREA COMMUNICATIONS PROGRAMS (FIGURE 7) ARE DESIGNED TO PROVIDE ESSENTIAL COMMUNICATIONS THROUGHOUT THE BATTLEFIELD IN ORDER TO EXERCISE EFFECTIVE COMMAND AND CONTROL OF U. S. FORCES. OUR FY 87 REQUEST OF $1,531M WILL PROCURE ADDITIONAL MODERN, INTEROPERABLE AREA COMMUNICATIONS SYSTEMS FOR ECHELONS ABOVE CORPS DOWN TO THE BATTALION LEVEL OF COMMAND. THIS REQUEST WILL CONTINUE THE PROCUREMENT OF TRI-TAC COMMUNICATIONS EQUIPMENT TO SUPPORT ECHELONS ABOVE CORPS FORCES.

IN ADDITION, THIS REQUEST WILL CONTINUE TO PROCURE THE MOBILE SUBSCRIBER EQUIPMENT FOR CORPS AND BELOW - THIS IS THE MOST IMPORTANT COMMUNICATIONS SYSTEM IN THE FY 87 BUDGET REQUEST. THE FIELDING OF MSE GIVES KEY COMMANDERS AND PRINCIPAL STAFF OFFICERS A FLEXIBLE, SECURE, AND MOBILE COMMUNICATIONS CAPABILITY NEVER BEFORE ACHIEVED ON THE BATTLEFIELD. THE FY 87 REQUEST FOR MSE WILL COMPLETE THE FIELDING OF III CORPS AND BEGIN FIELDING V CORPS.

# TACTICAL AREA COMMAND

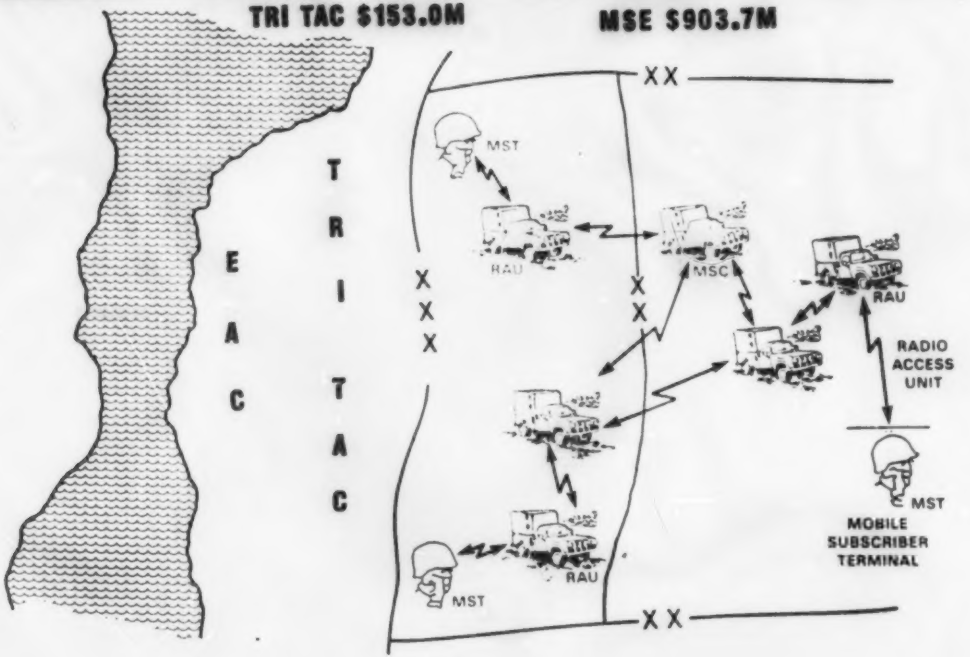

TRI TAC $153.0M
MSE $903.7M
EAC
TRI TAC
XXX
XX
XX
XX
MST
RAU
MSC
RAU
RADIO ACCESS UNIT
MST
MOBILE SUBSCRIBER TERMINAL
RAU
MST

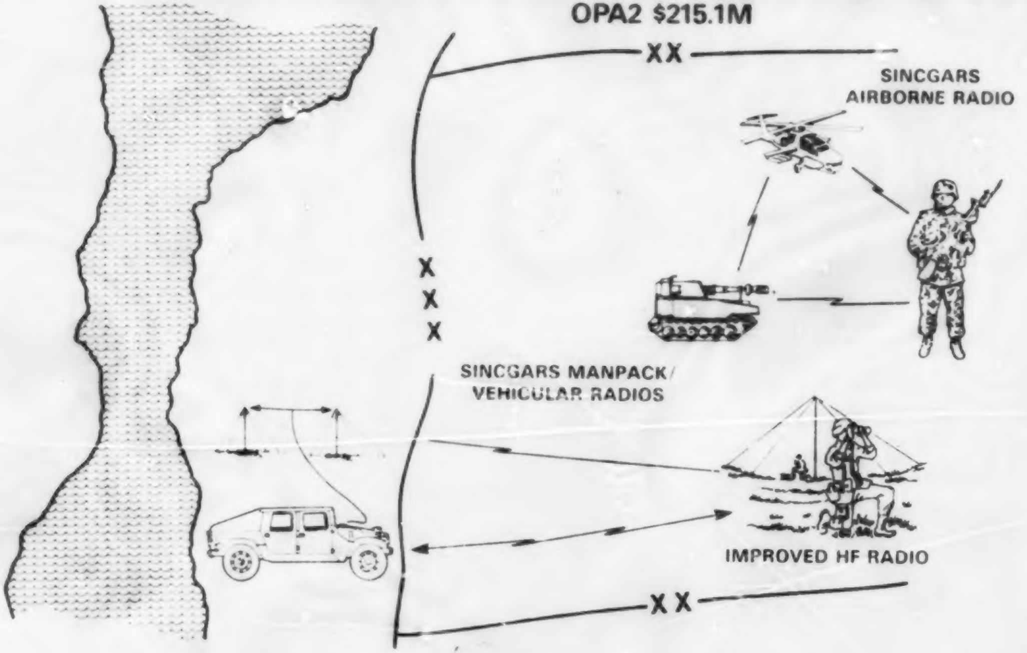
FIGURE 7

COMBAT NET RADIOS ARE AN INTEGRAL PART OF THE TOTAL COMMAND AND CONTROL FUNCTION. THESE RADIOS ARE USED EXTENSIVELY AT PLATOON THROUGH DIVISION LEVEL (FIGURE 8). OUR PRINCIPAL TACTICAL RADIO SYSTEM IS THE SINGLE CHANNEL GROUND AND AIRBORNE RADIO SYSTEM (SINCGARS). IT WILL REPLACE THE AN/PRC-77, AN/PRC-25 AND AN/VRC-12 FAMILY OF COMBAT NET RADIOS, WHICH ARE APPROACHING 25 YEARS OF SERVICE AND ARE TECHNOLOGICALLY OBSOLETE. SINCGARS PROVIDES A VERY EFFECTIVE ELECTRONIC COUNTER-COUNTERMEASURE (ECCM) PROTECTION, CALLED FREQUENCY HOPPING. THE LACK OF ECCM PROTECTION IS A MAJOR SHORTCOMING IN OUR CURRENT RADIOS. IN FY 87 THE ARMY WILL PROCURE 16,000 SINCGARS RADIOS, SUFFICIENT TO EQUIP 4 DIVISIONS.

OUR COMBAT NET RADIO PROGRAM IN FY 87 ALSO INCLUDES THE CONTINUED PROCUREMENT OF IMPROVED HIGH FREQUENCY RADIOS. THESE HIGH-RELIABILITY RADIOS ARE ALSO BUILT AROUND A COMMON TRANSCEIVER, AND ARE CONFIGURED IN MANPACK AND VEHICULAR CONFIGURATIONS. THESE RADIOS ARE ISSUED TO SELECTED USERS FROM ECHELONS ABOVE CORPS THROUGH BATTALION COMMAND PREDICATED ON THEIR REQUIREMENT FOR LONGER-RANGE, NON-LINE-OF-SIGHT COMMUNICATIONS.

# COMBAT SUPPORT - SINCGARS/IHFR

OPA2 $215.1M


XX
SINCGARS AIRBORNE RADIO
XXX
SINCGARS MANPACK/ VEHICULAR RADIOS
IMPROVED HF RADIO
XX

OUR STRATEGIC/DOD COMMUNICATIONS PROGRAMS ENCOMPASS THOSE PROGRAMS WHICH PROVIDE COMMAND AND CONTROL PRIMARILY AT THE NATIONAL COMMAND AUTHORITY/COMMANDER-IN-CHIEF LEVELS. OUR FY 87 REQUEST OF $475.4M INCLUDES FUNDING FOR THE GROUND SEGMENT OF THE DEFENSE SATELLITE COMMUNICATIONS SYSTEM (DSCS), WHICH EXECUTES OUR ASSIGNED RESPONSIBILITIES IN JOINT AND DOD C3I PROGRAMS. MODERNIZATION, EXPANSION AND INCREASED SURVIVABILITY ARE KEY IN THESE PROGRAMS. OUR FY 87 PROGRAM WILL PROVIDE MORE AUTOMATIC, SURVIVABLE AND EFFECTIVE CONTROL SYSTEMS FOR THE DSCS. MODERNIZATION WILL CONTINUE IN THE SATELLITE DIGITAL COMMUNICATIONS AND SUPPORTING SUBSYSTEMS.

ANOTHER SEGMENT OF OPA 2 IS BATTLEFIELD COMMAND AND CONTROL WHICH INCLUDES AUTOMATION AND DATA DISTRIBUTION EQUIPMENT TO SUPPORT TACTICAL AND LOGISTICS COMMANDERS FROM CORPS THRU BATTALION. THIS AREA INCLUDES:

- ADDS/PJH/JTIDS
- MCS
- IEW (ASAS)
- FIRE SUPPORT
- AIR DEFENSE
- COMBAT SERVICE SUPPORT.

EACH WILL BE ADDRESSED IN TURN.

IN FY 87 WE CONTINUE THE PROCUREMENT OF THE ARMY DATA DISTRIBUTION SYSTEM (ADDS) -- A TACTICAL DATA SYSTEM COMPOSED OF ENHANCED POSITION LOCATION REPORTING SYSTEM (PLRS) EQUIPMENT AND JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM (JTIDS) TERMINALS. ADDS WILL PROVIDE THE ARMY WITH A RELIABLE, JAM RESISTANT, HIGH SPEED COMPUTER TO COMPUTER DATA COMMUNICATIONS SYSTEM TO SIGNIFICANTLY IMPROVE COMMAND AND CONTROL FOR THE FIRE SUPPORT, AIR DEFENSE, AND INTELLIGENCE/ELECTRONIC WARFARE FUNCTIONS WITHIN THE ARMY COMMAND AND CONTROL SYSTEM (ACCS). FY 87 COMPLETES THE TWO YEAR PRE-PLANNED PRODUCT IMPROVEMENT (P3I) PROGRAM TO ENHANCE PLRS PRODUCTION EQUIPMENT TO THE FINAL ADDS CONFIGURATION. FY 87 INITIATES JTIDS CLASS 2 TERMINAL PROCUREMENT. THIS PROCUREMENT SUPPORTS FIELDING OF ADDS FOR TWO ARMY DIVISIONS.

THE FY 87 REQUEST ALSO INCLUDES FUNDING FOR THE MANEUVER CONTROL SYSTEM (MCS). OUR "HARDWARE MIX" STRATEGY FOR MCS INCLUDES A MIX OF FULLY MILITARIZED EQUIPMENT AND RUGGEDIZED OFF-THE-SHELF EQUIPMENT. THE PROCUREMENT FOR THE FULLY MILITARIZED VERSION OF MCS WAS COMPLETED IN FY 85. IN FY 87 WE

WILL PROCURE THE RUGGEDIZED COMMERCIAL NDI EQUIPMENT EXCLUSIVELY AND COMPLETE THE PROGRAM IN FY 88.

TACTICAL COMMANDERS HAVE AN IMMEDIATE NEED FOR AN AUTOMATED INTELLIGENCE SYSTEM THAT EFFECTIVELY MANAGES INTELLIGENCE AND ELECTRONIC WARFARE (IEW) OPERATIONS AND PROVIDES A NEAR REAL-TIME PICTURE OF ENEMY ACTIVITY. PROCUREMENT FOR THE ALL SOURCE ANALYSIS SYSTEM (ASAS) (ALSO KNOWN AS JOINT TACTICAL FUSION PROGRAM) WILL BEGIN IN FY 87 TO HELP SATISFY THAT NEED. PROCUREMENT DOLLARS WILL BUY THREE EACH LIMITED CAPABILITY CONFIGURATIONS (LCCS) OF ASAS FOR THE USA INTELLIGENCE CENTER AND SCHOOL AND FOR TWO DIVISIONS.

AUTOMATION IN THE FIRE SUPPORT ARENA PROVIDES IMPROVED ACCURACY AND SPEED IN ACCOMPLISHING THE VITAL FIRE SUPPORT MISSION FOR THE COMMANDER.

IN FY 87, WE CONTINUE TO PROCURE THE BATTERY COMPUTER SYSTEM (BCS) FOR NATIONAL GUARD AND RESERVE FIELD ARTILLERY UNITS. THIS SYSTEM AUTOMATICALLY COMPUTES AND TRANSMITS INDIVIDUAL FIRING DATA TO EACH WEAPON, THEREBY INCREASING THE SPEED, ACCURACY, AND EFFECTIVENESS OF ARTILLERY FIRE.

TO ACHIEVE FIRST ROUND ACCURACY AND ACCURATE UNOBSERVED FIRE, WEAPONS AND TARGET ACQUISITION SYSTEMS MUST BE ACCURATELY LOCATED ON A COMMON GRID. IN FY 87, WE WILL CONTINUE TO PROCURE THE POSITION AZIMUTH DETERMINING SYSTEM (PADS). PADS IS A RELIABLE, SELF-CONTAINED INERTIAL SURVEY DEVICE WHICH PROVIDES THE REQUISITE ACCURACY FOR POSITION AND DIRECTION. PADS IS ALSO USED TO UPDATE AND VALIDATE DATA FOR LESS ACCURATE POSITION/NAVIGATION SYSTEMS. THESE SYSTEMS WILL COMPLETE FIELDING TO THE ACTIVE FORCE AND BEGIN FIELDING TO THE NATIONAL GUARD AND RESERVE UNITS.

TO CORRECT FIRING DATA FOR THE EFFECTS OF WEATHER ON THE ACCURACY OF INDIRECT FIRE SUPPORT, THE ARMY HAS PROCURED THE METEOROLOGICAL DATA SYSTEM (MDS), WHICH PROVIDES FOR THE ACQUISITION, COMPUTATION AND TRANSMISSION OF WEATHER DATA. IN FY 87, WE WILL CONTINUE TO PROCURE THE MDS, TO INCLUDE A DOWNSIZED MODEL FOR THE LIGHT FORCES.

IN FY 87, THE PROCUREMENT OF THE FIRE SUPPORT TEAM - DIGITAL MESSAGE DEVICE (FIST-DMD) PROVIDES ENHANCED PLANNING, COORDINATION, AND EXECUTION CAPABILITY AT THE COMPANY LEVEL FOR THE HEAVY FORCES EQUIPPED WITH TACFIRE. THE FIST-DMD WILL ALSO BE FIELDED TO THE LIGHT DIVISION TO PROVIDE A VIABLE NEAR-TERM FIRE SUPPORT $C^2$ CAPABILITY. TO COMPLETE THE FIRE SUPPORT CHAIN FOR THE LIGHT DIVISION, WE WILL PROCURE IN FY 87, A FORWARD

ENTRY DEVICE (FED) SUITABLE FOR THE FOOT MOBILE FORWARD OBSERVER. THE FED IS A ONE-FOR-ONE REPLACEMENT FOR THE LARGER DIGITAL MESSAGE DEVICE (DMD) FIELDED IN THE HEAVY DIVISIONS. BOTH THE FIST-DMD AND THE FED WILL BE RETAINED WHEN THE ADVANCED FIELD ARTILLERY TACTICAL DATA SYSTEM (AFATDS) IS FIELDED IN THE 1990'S.

OTHER TACTICAL ADPE SYSTEMS BEING FIELDED TO SUPPORT THE LOGISTIC ARENA INCLUDE THE TACTICAL ARMY COMBAT SERVICE SUPPORT COMPUTER SYSTEM (TACCS) AND THE CORPS/THEATER ADPE SERVICE CENTER (CTASC).

TACTICAL ARMY COMBAT SERVICE SUPPORT COMPUTER SYSTEMS (TACCS) IS A RUGGEDIZED, TWO-MAN TRANSPORTABLE, USER-FRIENDLY MICROCOMPUTER SYSTEM USED ON THE BATTLEFIELD FOR THE COMBAT SERVICE SUPPORT MISSIONS OF PERSONNEL, SUPPLY, MAINTENANCE, MEDICAL, AMMUNITION AND TRANSPORTATION. IN FY 87, OVER 2,000 TACCS WILL BE PROCURED TO FIELD 11 DIVISIONS TO SUPPORT PERSONNEL FUNCTIONS.

THE CORPS/THEATER ADPE SERVICE CENTER (CTASC) PROVIDES STANDARD TRANSPORTABLE COMPUTER HARDWARE TO PERFORM CONSOLIDATING TYPE PROCESSING FOR STANDARD MULTI-COMMAND MANAGEMENT INFORMATION SYSTEMS (STAMMIS) AT CORPS AND THEATER LEVELS. THESE SYSTEMS PROVIDE AUTOMATION SUPPORT TO A VARIETY OF FUNCTIONAL AREAS; I.E., SUPPLY, MAINTENANCE, PROPERTY ACCOUNTABILITY, FINANCIAL MANAGEMENT. IN FY 87, A CONTRACT WILL BE AWARDED TO PROCURE AN ADDITIONAL 6 CTASCS FOR USAREUR, CONUS, WESTCOM AND IX CORPS.

ANOTHER MAJOR AREA OF OPA 2 IS SUSTAINING BASE COMMUNICATIONS/ADPE WHICH FUNDS THOSE ESSENTIAL NON-TACTICAL EQUIPMENTS REQUIRED TO EFFECTIVELY MAINTAIN THE SUPPORTING BASE FOR TACTICAL AND STRATEGIC FORCES. OUR REQUEST INCLUDES FUNDING FOR THE CONTINUED MODERNIZATION AND EXPANSION OF THE TERRESTRIAL LONG-HAUL COMMUNICATIONS SYSTEMS. THESE PROJECTS INCLUDE:

o INSTALLATION OF A FIBER-OPTIC BACKBONE TRANSMISSION SYSTEM IN KOREA, FOR WHICH THE COST IS SHARED WITH THE GOVERNMENT OF KOREA.

o ADDITION OF BULK ENCRYPTION CAPABILITY, AND CONVERSION FROM ANALOG TO DIGITAL MICROWAVE TRANSMISSION, IN THE DIGITAL EUROPEAN BACKBONE (DEB) SYSTEM.

OUR SUSTAINING BASE ADPE PROGRAMS INCLUDE VARIOUS INITIATIVES TO INCREASE THE PRODUCTIVITY OF ARMY OPERATIONS. THESE INITIATIVES RANGE FROM EXPANSION OF THE STANDARD ARMY

AUTOMATED CONTRACTING SYSTEM (SAACONS), FOR INSTALLATIONS, TO PROCUREMENT OF A THIRD SUPERCOMPUTER. THE SUPERCOMPUTER, AN EXTREMELY HIGH SPEED COMPUTER CAPABLE OF MAKING HUNDREDS OF MILLIONS OF CALCULATIONS PER SECOND, IS ESSENTIAL TO SATISFYING THE DRAMATICALLY INCREASING NEED FOR COMPUTATIONAL POWER REQUIRED BY ARMY ACTIVITIES. THESE SYSTEMS WILL ALLOW LARGER SIMULATIONS TO BE RUN, AND WILL PERMIT SIMULATION TO BE SUBSTITUTED FOR ACTUAL TESTING IN MANY INSTANCES, THUS SAVING TIME AND MONEY DURING THE PROCESS.

OUR REQUEST FOR RECONNAISSANCE, SURVEILLANCE, TARGET ACQUISITION (RSTA) AND IEW EQUIPMENT INCLUDES FUNDING FOR SYSTEMS ESSENTIAL TO THE LOCATION AND IDENTIFICATION OF TARGETS ON THE BATTLEFIELD. THE AQUILA WILL ENHANCE THE EFFECTIVENESS OF FIELD ARTILLERY BEYOND THE FORWARD LINE OF TROOPS BY PROVIDING TARGET ACQUISITION, CONVENTIONAL ARTILLERY ADJUSTMENT AND LASER DESIGNATION FOR "SMART" MUNITIONS (FIGURE 9). THE SYSTEM IS DESIGNED TO PERFORM ITS MISSIONS AND SURVIVE IN AN ENEMY ENVIRONMENT CHARACTERIZED BY INTENSE ELECTROMAGNETIC COUNTERMEASURES AND AIR DEFENSES WHERE THE RISK TO MANNED AIRCRAFT WOULD BE HIGH.

# TACTICAL ELECTRONICS - RPV

OPA2 $117.7M

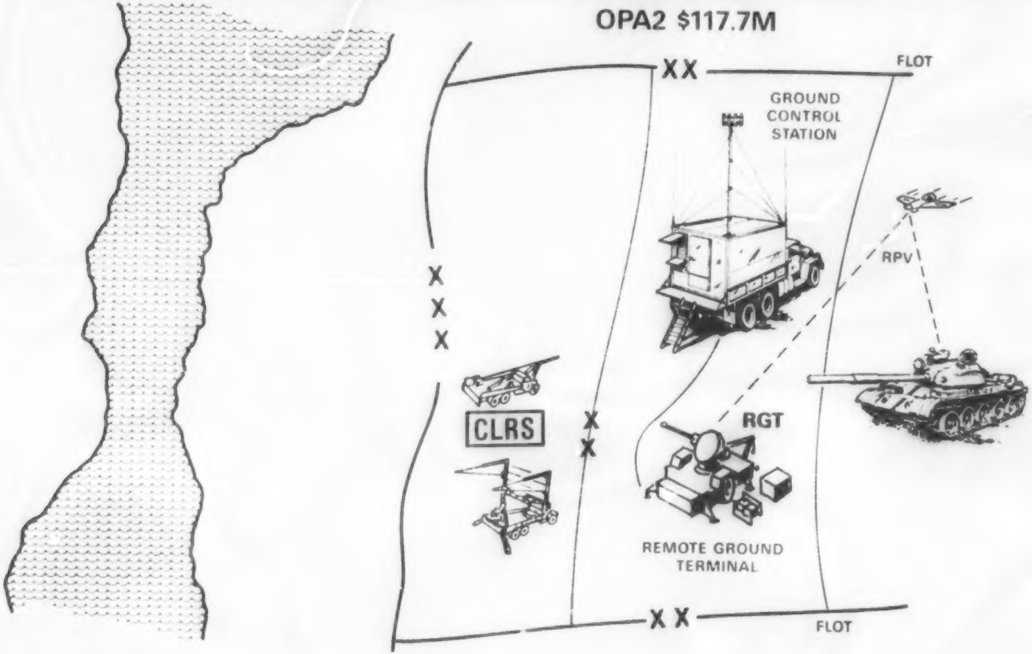

XX
FLOT
GROUND CONTROL STATION
RPV
XXX
CLRS
XX
RGT
REMOTE GROUND TERMINAL
XX
FLOT

FIGURE 9

ANOTHER RSTA SYSTEM WHICH IS BEING DEVELOPED JOINTLY WITH THE USAF IS THE JOINT STARS, A BATTLE MANAGEMENT (TARGET AND SITUATION DEVELOPMENT) AND TARGETING SYSTEM WHICH DETECTS, LOCATES, TRACKS, CLASSIFIES AND ASSISTS IN ATTACKING BOTH MOVING AND STATIONARY TARGETS BEYOND THE FLOT (FIGURE 10).

# TACTICAL ELECTRONICS - JSTARS

OPA2 $63.4M

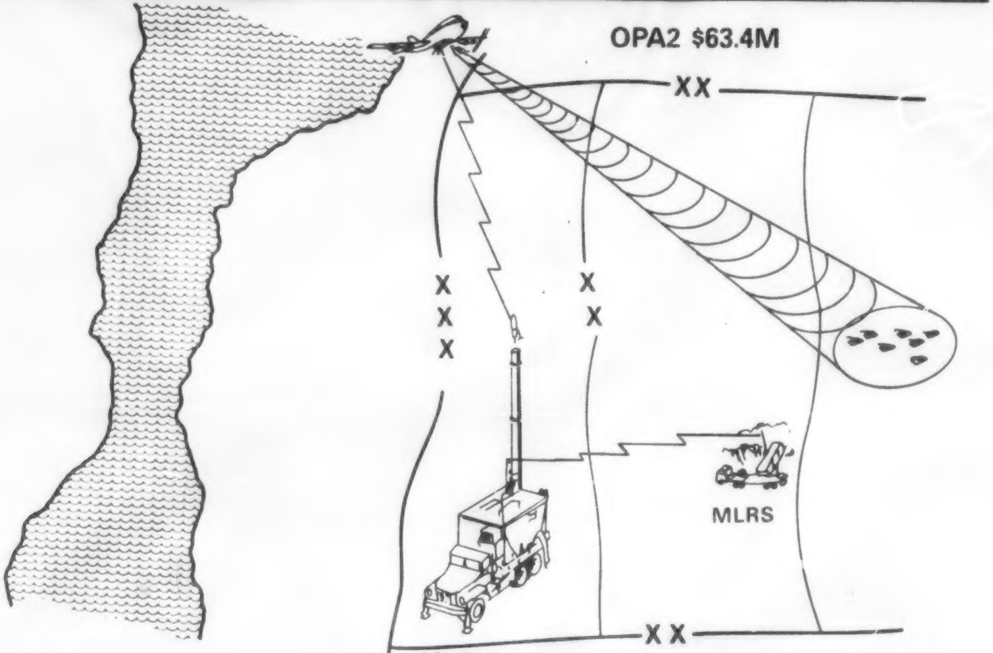

XX
XXX
XX
XX
MLRS
AN/TSQ-132
GROUND STATION MODULE

FIGURE 10

DEDICATED TO THE LAND COMPONENT COMMANDER. IT IS AN "ELECTRONIC HIGH GROUND" WHICH PROVIDES A COMMON AND COHERENT VIEW OF THE BATTLEFIELD. THE AIR FORCE IS THE EXECUTIVE SERVICE FOR THE PRIME MISSION EQUIPMENT. AS THE PARTICIPATING SERVICE THE ARMY IS RESPONSIBLE FOR THE GROUND STATION MODULE, WHICH IS A DATA PROCESSING AND DISTRIBUTION SYSTEM.

THE ARMY'S EMPHASIS ON A NIGHT FIGHTING CAPABILITY HAS RESULTED IN AN INCREASED REQUIREMENT FOR PROCUREMENT OF NIGHT VISION DEVICES. THE ARMY'S FY 87 REQUEST WILL PROCURE OVER 18,000 NIGHT VISION GOGGLES/SIGHTS AND DIRECT NIGHT VISION SUPPORT AND MAINTENANCE EQUIPMENT AS PART OF THE FIVE-YEAR MULTI-YEAR OMNIBUS CONTRACT (FY 85-89). THIS OMNIBUS CONTRACT WILL YIELD INCREASED QUANTITIES OF URGENTLY NEEDED NIGHT VISION DEVICES WHICH WILL ENABLE THE ARMY TO MOVE TOWARD THE OBJECTIVE OF BEING ABLE TO FIGHT AS EFFECTIVELY AT NIGHT AS IN THE DAY.

THE NEED TO QUICKLY IDENTIFY AND LOCATE ENEMY TACTICAL COMMAND POSTS, FIRE DIRECTION CENTERS AND TROOP STAGING AREAS IN A FAST MOVING COMBAT SCENARIO IS WELL KNOWN, AS IS THE NEED TO BE ABLE TO DENY HIM THE USE OF THE COMMUNICATIONS ASSOCIATED WITH THESE ELEMENTS. FOR THE GROUND TACTICAL COMMANDER THIS IS ACCOMPLISHED THROUGH OUR INTELLIGENCE LOCATING SYSTEMS: THE AN/TSQ-114 TRAILBLAZER FOR OUR HEAVY DIVISIONS AND THE AN/PRD-10 MANPORTABLE DIRECTION FINDING SET FOR OUR LIGHT DIVISIONS. THE ENEMY IS DENIED USE OF HIS OWN COMMUNICATIONS THROUGH ELECTRONIC WARFARE SYSTEMS SUCH AS THE AN/MLQ-34 TACJAM. THE TROJAN SYSTEM WILL GREATLY INCREASE THE LINGUISTIC AND ANALYTIC SKILLS OF OUR SOLDIERS AND WILL ALSO PROVIDE NEAR REAL TIME COMBAT INFORMATION FOR COMMANDERS ON CONTINGENCY FORCE TARGETS.

THE CRITICAL AREA OF OPA 3 WHICH WAS MENTIONED EARLIER IS ALSO NEEDED TO SUSTAIN OUR COMBAT FORCE. OPA 3 CONSISTS OF KEY COMBAT SUPPORT AND COMBAT SERVICE SUPPORT SYSTEMS THAT CUT ACROSS THE LOGISTICAL AND SUPPORT FORCES WITHIN THE ARMY. WHEN TRANSLATED INTO FORCES, OPA 3 PROCURES THE EQUIPMENT NEEDED BY CHEMICAL, ORDNANCE, MEDICAL, ENGINEER, TRANSPORTATION AND QUARTERMASTER UNITS IN ORDER FOR THEM TO EFFECTIVELY SUPPORT OUR COMBAT SYSTEMS. THE OPA 3 FUNDING PROFILE FOR FY 85 THROUGH FY 88 IS SHOWN IN FIGURE 11.

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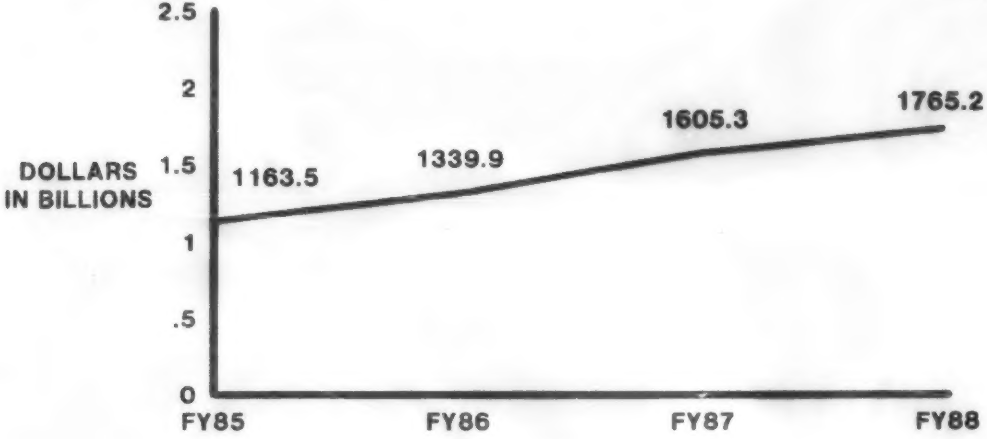
## OPA-3 OTHER SUPPORT EQUIPMENT
## FY 87 PRESIDENT'S BUDGET

FIGURE 11



FOR EASE OF ANALYSIS AND MANAGEMENT, THE FY 87 OPA 3 BUDGET REQUEST IS GROUPED INTO 5 FUNCTIONAL AREAS. THE PREPAREDNESS PROVIDED BY EACH OF THESE AREAS IS ESSENTIAL IF COMBAT FORCES ARE GOING TO OPERATE EFFECTIVELY AND BE SUSTAINED. DISTRIBUTION OF THE FY 87 PROGRAM IS AS SHOWN IN THE FOLLOWING TABLE AND FIGURES 12 AND 13:

## TABLE 4

## BUDGET ACTIVITY 3 - OTHER SUPPORT EQUIPMENT
## FY 87 PRESIDENT'S BUDGET

| FUNCTION AREA | MILLIONS OF DOLLARS |
|---|---|
| ENGINEER EQUIPMENT | 331.2 |
| SOLDIER SUPPORT EQUIPMENT | 336.5 |
| LOGISTICS SUSTAINABILITY | 372.4 |
| MEDICAL EQUIPMENT | 207.7 |
| OTHER (SUPPORT EQUIPMENT) | 357.5 |
| TOTAL | $ 1,605.3 |

# OTHER PROCUREMENT, ARMY
# OTHER SUPPORT EQUIPMENT

FY 87 TOA = $1605.3

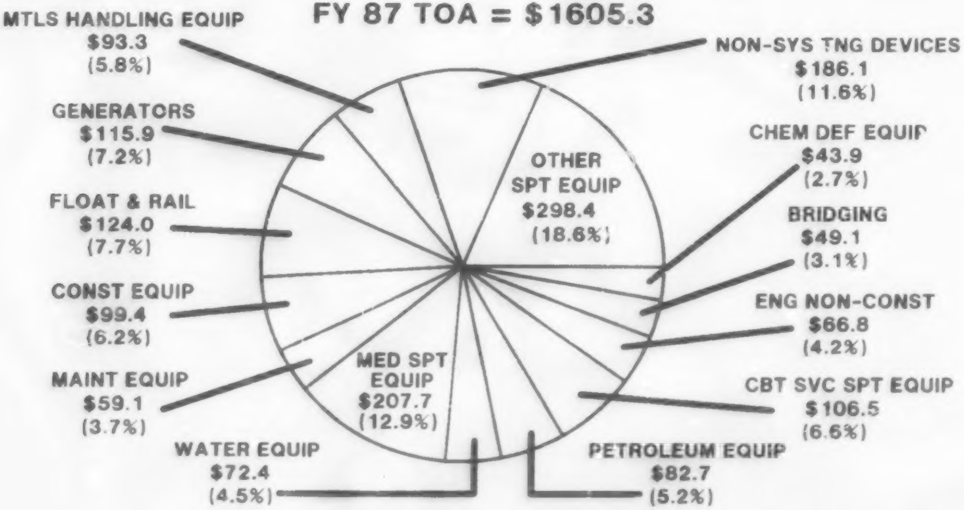
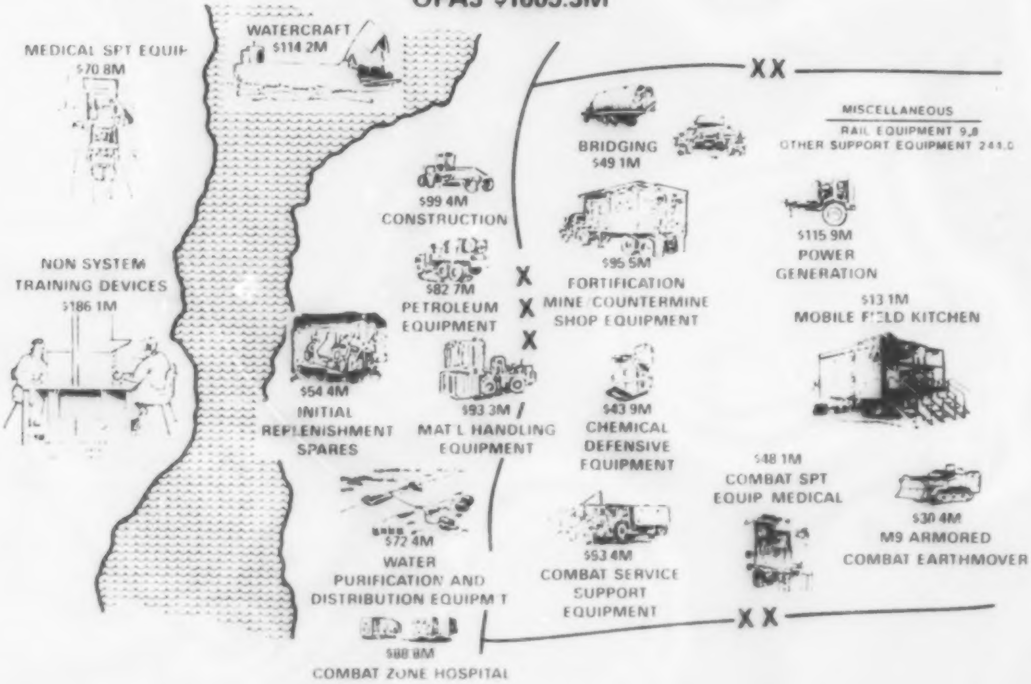


FIGURE 12

# SUPPORT SYSTEMS

OPA3 $1605.3M



MEDICAL SPT EQUIP
$70 8M

WATERCRAFT
$114 2M

NON SYSTEM
TRAINING DEVICES
$186 1M

$99 4M
CONSTRUCTION

$82 7M
PETROLEUM
EQUIPMENT

$54 4M
INITIAL
REPLENISHMENT
SPARES

$93 3M
MAT'L HANDLING
EQUIPMENT

$72 4M
WATER
PURIFICATION AND
DISTRIBUTION EQUIPMENT

$88 8M
COMBAT ZONE HOSPITAL

BRIDGING
$49 1M

$95 5M
FORTIFICATION
MINE/COUNTERMINE
SHOP EQUIPMENT

$43 9M
CHEMICAL
DEFENSIVE
EQUIPMENT

$53 4M
COMBAT SERVICE
SUPPORT
EQUIPMENT

MISCELLANEOUS
RAIL EQUIPMENT 9,8
OTHER SUPPORT EQUIPMENT 241,0

$115 9M
POWER
GENERATION

$13 1M
MOBILE FIELD KITCHEN

$48 1M
COMBAT SPT
EQUIP MEDICAL

$30 4M
M9 ARMORED
COMBAT EARTHMOVER

FIGURE 13

THE FY 87 REQUEST OF $43.9 MILLION FOR CHEMICAL DEFENSIVE EQUIPMENT IS REQUIRED TO PROCURE BADLY NEEDED CHEMICAL-BIOLOGICAL INDIVIDUAL AND COLLECTIVE PROTECTION, DETECTION, WARNING, AND DECONTAMINATION EQUIPMENT. THIS CHEMICAL DEFENSIVE EQUIPMENT MUST BE AVAILABLE FOR U.S. COMBAT FORCES TO SURVIVE IF REQUIRED TO FIGHT IN A CHEMICALLY CONTAMINATED ENVIRONMENT. OF SPECIAL NOTE THIS YEAR, IS OUR REQUEST FOR $19.9 MILLION FOR THE CONTINUED PROCUREMENT OF THE NEW XM40 PROTECTIVE MASK WHICH WILL REPLACE THE CURRENT FIELD, AIRCRAFT AND TANKER MASKS. THE XM40 WILL PROVIDE IMPROVED EYE AND RESPIRATORY SYSTEM PROTECTION. THIS SUPPORTS OUR SOLDIER ENHANCEMENT OBJECTIVE.

THE $49.1 MILLION BEING REQUESTED FOR BRIDGING EQUIPMENT INCLUDES OVER $28.6 MILLION FOR RIBBON BRIDGE COMPONENTS. ALSO, WE ARE REQUESTING APPROXIMATELY $19.2 MILLION FOR CONTINUED PROCUREMENT OF SHALLOW DRAFT, 27 FOOT BRIDGE ERECTION BOATS WHICH ENABLE THE ARMY TO USE THE RIBBON BRIDGE SYSTEM IN BOTH SHALLOW AND DEEP WATER.

$66.8 MILLION IS BEING REQUESTED FOR ENGINEER (NON-CONSTRUCTION) EQUIPMENT. INCLUDED IN THIS CATEGORY IS $30.4 MILLION FOR THE M9 ARMORED COMBAT EARTHMOVER (ACE). THE SUCCESS OF OUR THOROUGH FOLLOW-ON EVALUATION (FOE), CONDUCTED DURING MARCH-JUNE 1985, RESULTED IN A DECISION TO PROCEED WITH FULL PRODUCTION AND WAS KEY TO OBTAINING THE FY 86 APPROPRIATION OF $42.4 MILLION. THE ARMY PLANS A COMPETITIVE SINGLE YEAR PROCUREMENT WITH PRICED OPTIONS. THE FY 86 INITIAL CONTRACT AWARD IS SCHEDULED FOR AUGUST 1986. THE FY 87 BUDGET REQUEST WILL PERMIT THE ARMY TO EXECUTE THE SECOND YEAR OF FULL PRODUCTION. IN ADDITION, IN THIS CATEGORY WE ARE REQUESTING FUNDS TO PROCURE THE XM139 DISPENSER WHICH IS DESIGNED FOR USE WITH THE VOLCANO SYSTEM. IT CONSISTS OF LAUNCHER RACKS, A DISPENSER CONTROL UNIT AND MOUNTING HARDWARE FOR MOUNTING ON A VARIETY OF GROUND VEHICLES AND THE UH-60 HELICOPTER. THE XM139 WILL BE USED TO EMPLACE ANTI-TANK AND ANTI-PERSONNEL MINES. OUR FY 87 REQUEST ALSO INCLUDES A MINE PLOW WHICH CREATES A CLEARED PATH THROUGH A MINEFIELD BY CLEARING SURFACE AND BURIED ANTI-TANK AND ANTI-PERSONNEL MINES OF ANY TYPE FUSING. IT ALSO INCLUDES THE MINE DETECTING SET , AN/PSS-12 WHICH IS A PORTABLE, HAND-HELD UNIT OPERATED BY AN INDIVIDUAL SOLDIER TO LOCATE METALLIC ANTI-PERSONNEL AND ANTI-TANK MINES IN ALL TYPES OF SOIL.

THE $105.5 MILLION REQUESTED FOR COMBAT SERVICE SUPPORT EQUIPMENT PROVIDES FOR CONTINUED ACQUISITION OF NUMEROUS ITEMS -

INCLUDING AIR CONDITIONERS, FIRE TRUCKS, MOBILE FIELD KITCHENS, PRINTING AND BINDING EQUIPMENT, LAUNDRY UNITS, AND DIVING EQUIPMENT. EACH OF THESE DIVERSE ITEMS SERVES A DISTINCT AND ESSENTIAL FUNCTION IN SUSTAINING OUR COMBAT FORCES.

THE FY 87 PETROLEUM EQUIPMENT PROGRAM OF $82.7 MILLION CONTINUES PROGRAMS FOR ESSENTIAL PETROLEUM STORAGE AND DISTRIBUTION EQUIPMENT SUCH AS 10,000 AND 50,000 GALLON COLLAPSIBLE TANKS, AND THE 350 GPM PUMP ASSEMBLY. IN FY 87 WE ARE ALSO REQUESTING FUNDS FOR THE SOUTHWEST ASIA PETROLEUM DISTRIBUTION SYSTEM (SWAPDOP) WHICH SUPPORTS LOGISTICS-OVER-THE-SHORE OPERATIONS AND ALSO PROVIDES A FIXED PIPELINE IN SUPPORT OF THE CINCCENT. THIS PROGRAM INCLUDES TACTICAL LARGE BULK VOLUME COLLAPSIBLE STORAGE TANKS, HOSES, PUMPS, TACTICAL PIPELINE, AND EQUIPMENT TO SUPPORT THE SHIP-TO-SHORE MOVEMENT OF POL SUCH AS MOORING SYSTEMS AND UNDERSEA PIPELINE/HOSELINE.

THE FY 87 REQUEST INCLUDES $72.4 MILLION FOR THE ARMY'S WATER SUPPORT PROGRAM. WE CONTINUE PROCUREMENT OF THE 600 AND 3,000 GPH REVERSE OSMOSIS WATER PURIFICATION UNITS. IN ADDITION, WE WILL CONTINUE TO BUY 65 GPM PUMPS AND MOBILE WATER CHILLERS.

THE FY 87 REQUEST OF $207.7 MILLION FOR MEDICAL EQUIPMENT PROVIDES FOR THE PROCUREMENT OF VITAL INVESTMENT EQUIPMENT FOR BOTH ARMY FIXED MEDICAL FACILITIES AND FIELD MEDICAL UNITS WORLDWIDE. INCLUDED IS MEDICAL CARE AND SUPPORT EQUIPMENT FOR NEW MILITARY CONSTRUCTION PROGRAMS AS WELL AS FOR RENOVATION AND MODERNIZATION PROJECTS. ALSO, FUNDS ARE REQUESTED FOR PROCUREMENT OF ENVIRONMENTAL CONTROL SYSTEMS, TACTICAL SHELTERS AND THE EXTENDABLE, MODULAR TENTS REQUIRED TO FIELD THE ARMY COMBAT ZONE HOSPITALS. THE FY 87 REQUEST IS ESSENTIAL TO CONTINUE EQUIPPING AN AUSTERE MEDICAL FORCE STRUCTURE. WITHOUT IT, FIELD MEDICAL SUPPORT WOULD BE INADEQUATE, PROPER TREATMENT OF CASUALTIES WOULD BE PREVENTED, AND A LOSS OF OUR SOLDIERS WHO COULD OTHERWISE BE RETURNED TO DUTY WITHIN A THEATER OF OPERATIONS WOULD RESULT. EVEN WITH FULL FUNDING, IT WILL BE SEVERAL YEARS BEFORE THE MEDICAL FORCE STRUCTURE IS ADEQUATELY EQUIPPED TO MEET MINIMUM SUPPORT REQUIREMENTS.

THE FY 87 REQUEST INCLUDES $59.1 MILLION FOR MAINTENANCE EQUIPMENT. THE FY 87 PROGRAM CONTINUES OUR PROCUREMENT OF TRAILER MOUNTED WELDING SHOP SETS, THE SEMI-TRAILER MOUNTED ELECTRICAL REPAIR SHOP SET, AND CALIBRATION SET SUPPORT EQUIPMENT. THE MAINTENANCE EQUIPMENT TO BE PROCURED IN FY 87 IS

NEEDED TO KEEP OUR COMBAT SYSTEMS READY TO FIGHT, ALLOWING US EFFECTIVE AND SUSTAINED USE OF THE KEY WEAPONS IN WHOSE CAPABILITY WE HAVE SO MUCH INVESTED.

THE FY 87 REQUEST OF $99.4 MILLION FOR CONSTRUCTION EQUIPMENT WILL CONTINUE PROCUREMENT OF BULLDOZERS UNDER THE STANDARDIZATION PROGRAM FOR COMBAT CONSTRUCTION EQUIPMENT (CCE). IN ADDITION, THE FY 87 PROGRAM WILL PROVIDE FUNDS TO CONTINUE PROCUREMENT OF THE SMALL EMPLACEMENT EXCAVATOR (SEE).

IN FY 87, WE ARE REQUESTING $124.0 MILLION FOR FLOAT AND RAIL EQUIPMENT. INCLUDED IN OUR REQUEST ARE FUNDS FOR CONTINUATION OF OUR PROGRAM FOR PROCUREMENT OF COMMERCIAL LANDING CRAFT, UTILITY (LCU); LOGISTIC SUPPORT VESSELS; AND CAUSEWAY SYSTEMS. IN ADDITION, WE ARE REQUESTING FUNDS TO PROCURE NEW STARTS INCLUDING INLAND AND COASTAL WATERWAYS TUGS AND THE 20,000 GALLON POL RAILWAY TANK CAR.

THE FY 87 REQUEST OF $93.3 MILLION FOR MATERIEL HANDLING EQUIPMENT INCREASES OUR PREPAREDNESS FOR MOVING AMMUNITION AND OTHER SUPPLIES RAPIDLY. MATERIEL HANDLING EQUIPMENT WILL SUPPORT THE COMBAT FORCE AT FIXED LOCATIONS AND ALSO WILL SUPPORT THE RAPID DEPLOYMENT FORCE IN LOGISTICS-OVER-THE-SHORE (LOTS) OPERATIONS. THE FORKLIFTS REQUIRED TO MOVE THE AMMUNITION AND OTHER SUPPLIES ON AND OFF TRUCKS AND RAILCARS ARE A KEY LINK IN SUPPORTING OUR FIGHTING FORCE. THE FY 87 PROGRAM WILL CONTINUE A STANDARDIZATION PROGRAM FOR VARYING SIZES OF COMMERCIAL FORKLIFTS CRITICAL TO THE EFFICIENT HANDLING OF AMMUNITION.

TRAINING IS AN ESSENTIAL PART OF PREPAREDNESS AND TRAINING DEVICES ARE ESSENTIAL TO COMBAT SOLDIERS IF THEY ARE TO BE PROFICIENT IN THEIR MILITARY SPECIALTIES. OUR FY 87 BUDGET REQUEST INCLUDES OVER $185 MILLION FOR PROCUREMENT OF NON-SYSTEM TRAINING DEVICES IN RESPONSE TO THIS IMPORTANT REQUIREMENT.

FOR GENERATORS AND ASSOCIATED EQUIPMENT, THE FY 87 REQUEST INCLUDES $115.9 MILLION. THIS PROVIDES FOR ACQUISITION OF 15 DIFFERENT SIZE/CAPACITY GENERATORS AND OVER 20 DIFFERENT POWER UNITS USED IN VARIOUS MOBILE APPLICATIONS. THIS EQUIPMENT PROVIDES POWER SOURCES FOR MODERN ELECTRICAL SYSTEMS TO SUPPORT THE FUNCTION OF EXISTING GENERATORS AND THE FIELDING OF NEW COMMUNICATIONS, WEAPONS AND OTHER COMBAT AND COMBAT SUPPORT SYSTEMS.

THE FINAL OPA 3 FUNCTIONAL AREA TO BE DISCUSSED IS OTHER SUPPORT EQUIPMENT, WHICH ENCOMPASSES A BROAD RANGE OF EQUIPMENT AND PROGRAMS FOR DAY-TO-DAY OPERATION OF THE ARMY. THIS

CATEGORY ENCOMPASSES A NUMBER OF MAJOR THRUSTS, SUCH AS PROCUREMENT OF OPA 3 SPARE PARTS, PRODUCTION BASE SUPPORT, AND THE CONTINUED UPGRADE OF AREA-ORIENTED DEPOTS WITH THE LATEST STATE-OF-THE-ART EQUIPMENT IN ORDER TO ECONOMIZE AND STREAMLINE OPERATIONS.

IN PREPARING THE FY 87 BUDGET REQUEST, THE ARMY HAS CONTINUED TO PLACE EMPHASIS ON A BALANCED COMBAT READY FORCE WHICH CAN FIGHT EFFECTIVELY AND SUSTAIN ITSELF ON THE BATTLEFIELD. WE HAVE REQUESTED EQUIPMENT TO FILL PRESENT UNIT EQUIPMENT SHORTAGES OF COMMON AND SUPPORT TYPE ITEMS AND REPLACE SOME OF OUR OVER-AGE EQUIPMENT IN THE FIELD. IN ADDITION, WE HAVE CONTINUED TO ADDRESS THE RESERVE COMPONENTS' EQUIPMENT PROGRAMS. WE ALSO RECOGNIZE AND HAVE PLANNED FOR INCREASED REQUIREMENTS FOR COMMON SUPPORT TYPE ITEMS THAT RESULT FROM THE FIELDING OF NEW WEAPONS SYSTEMS. THE FY 87 INCREASES IN OTHER PROCUREMENT, ARMY REFLECT THE IMPORTANCE OF THIS VITAL AREA TO OUR ABILITY TO DETER WAR OR, FAILING THAT, TO FIGHT AND WIN.

## MISSILE PROCUREMENT ARMY

### AIR DEFENSE SYSTEM, HEAVY

Mr. ADDABBO [presiding]. The budget includes a request of $9.1 million for a new item identified as Air Defense System, Heavy. Army documentation shows this to be for procurement of long lead items for a system yet to be determined.

Why are long lead funds needed in fiscal year 1987? Aren't the candidates all off-the-shelf items?

General CIANCIOLO. Sir, I will take that question. With regard to the last part of your question first, the answer is it is our intent that they be nondevelopmental items that we procure to satisfy this requirement for the Forward Area Air Defense (FAAD) system for the heavy divisions, and the $9.1 million procurement that we have requested in 1987 is in fact to procure long lead items for that system.

Mr. ADDABBO. Well, long lead items can mean anything. What specifically is to be purchased with these funds?

General CIANCIOLO. Sir, as a result of our current evaluation we have gone to industry with a request for information on those systems that are currently in production or close to production, at least protype phase.

We intend to conduct a competition beginning this year, and into 1987 for any of those candidates that can satisfy the Army's requirement and when we select the one to be procured, we will then procure the long lead items necessary to get it into the Army inventory.

Mr. ADDABBO. General, absent the knowledge of the system eventually to be procured, how can the Army know what is to be purchased with fiscal year 1987 funds, or what the cost will be?

General CIANCIOLO. Because of the urgency of trying to fill the void left by the cancellation of the DIVAD, I am sure that you understand that we had to act quickly to try to provide a critically needed air defense capability to our forward element. We chose to do this not through a normal research and development program because we didn't have time.

We then in programming and budgeting essentially attempted to provide what we consider to be reasonable funding in fiscal year 1987 to procure long lead items of whatever system we selected during this competition.

These systems are considered to be mature systems and we will be able to tell you more specifically what that money is for once the item is selected. We wanted to be able to execute the procurement in 1987.

[Additional information follows:]

The current approach to filling the critical need for air defense in the heavy divisions, at the soonest possible time, is to evaluate and select from a list of non-developmental item (NDI) candidates that system which best meets the needs of Forward Area Air Defense. The Fiscal Year 1987 Budget submit is based on awarding a contract for the procurement of long lead items to reduce the lead time required from Low Rate Initial Production contract award to initial delivery of the Forward Line of Sight-Heavy component of the Forward Area Air Defense System. Even though the system to be selected is unknown at this time, and even though we anticipate procuring an off the shelf item, our NDI strategy dictates that we budget for long lead items to support the timely production of the eventual winner. Further, it is unlikely that the selected contractor, even if already in production, would have sufficient long lead items on hand to support an increase in production rate. The $9.1 million request for long lead item procurement is based on historical data, engineering estimates, and procurement experience of like systems. The requested funds would be used to procure such long lead items as high reliability semi-conductors, specialized cables and connectors, munitions and rocket motor propellants. Specific definition of long lead item requirements will not be known until such time that the system is selected

## LASER HELLFIRE

Mr. ADDABBO. The budget contains no request for laser Hellfire, the missile which is the primary anti-armor weapon of the AH-64 helicopter. The entire explanation in General Cianciolo's statement is as follows: "No procurement request was submitted in 1987 to procure missiles due to production delays".

Please explain the nature and cause of these production delays.

General CIANCIOLO. Yes, sir. The nature of the delays rests in the guidance package of the Hellfire missile. It was susceptible to high humidity levels.

We stopped the production until those high humidity level deficiences could be corrected. It has taken a long time to correct those deficiencies. The reason primarily rests with the procedures used to coat the printed circuit board in the guidance section.

A first article test was conducted during the months of October and into December for coating those circuit cards in a new simplified method. The test was successful and the first article test was completed.

We have right now under contract some 15,000 plus Hellfire missiles. We did not want to request any more funding until we were sure that the production problems were solved and that we would be a quality product but not until such time as the contractor could demonstrate that.

Mr. ADDABBO. Do you have two contractors?

General CIANACIOLO. Yes, sir, we have two contractors. It started out with one contractor who did the guidance package and a second contractor who constructed the missile.

We entered into an acquisition strategy to get competition into the program. The primary contractor for the missile component was Rockwell International and the seeker component was Martin Marietta. We now have them competing with each other to build an "all up round." That is our competition in the current program with Rockwell leading the way through use of a technical data package and Martin Marietta following their lead.

Mr. ADDABBO. Well, do both contractors have the same problems right now?

General CIANCIOLO. The problem is solved right now. Martin could not proceed on because they were following Rockwell since Rockwell was the lead in satisfying the requirements for providing technical data package.

Mr. ADDABBO. When will they be corrected?

General CIANCIOLO. Is is correct now, as I said. We conducted a test in the October-December time frame of this year, and the system has now passed the first article test.

Mr. **Addabbo**. What will be the added cost of this break in production schedule, both immediately and over the life of the program?

General **Cianciolo**. There are some additional costs but the contractor are shouldering most of the cost right now because of his production delays.

Mr. **Addabbo**. Will these added costs more than offset the cost reductions which were hoped to be realized by contracting for all-up-rounds?

General **Cianciolo** It is not our intent that they should, sir. As far as I know, they will.

[Additional information follows:]

The Hellfire Project Manager's Office has structured the fiscal year 1986 program to avoid a break in the production schedule. The fiscal year 1986 deliveries are scheduled to begin in April 1988 and continue over 16 months through July 1989. Fiscal year 1988 deliveries will begin in August 1989, therefore avoiding a break in production. The cost associated with restructuring the fiscal year 1986 program from a 12 month funded delivery period to a 16 month funded delivery period amount to approximately $16 million.

The contractors will absorb the costs for schedule delays in the fiscal year 1985 and prior contracts. Costs of restructuring the fiscal year and beyond program are a government responsibility.

The production delays which precipitated the fiscal year 1987 "skip year" of procurement for laser Hellfire would have occured even without the all-up procurement strategy. The Hellfire Project Manager's Office has evidence that the all-up-round strategy will hold the costs to a minimum. It appears the cost reductions over the program will exceed original expectations. The strategy was justified based on cost reductions of at least $60 million. The Project Manager's Office now anticipates savings of two to three times that amount.

Mr. **Addabbo**. It appears that the numbers of missiles planned for fiscal years 1988 through 1991 are considerably lower than were planned when the all-up-round strategy was first justified.

For the record, supply the answers to the following questions.

General **Cianciolo**. Okay, sir, we will do that.

[**Clerk's note**.—Questions submitted by Mr. Addabbo and the answers thereto follow:]

**Question**. Provide for the record a comparison of the procurement profile as it existed last year and as it exists now.

General **Cianciolo**:

|  | FY85 and prior | FY86 | FY87 | FY88 | FY89 | FY90 | FY91 | To Comp | Total |
|---|---|---|---|---|---|---|---|---|---|
| FY86 P.B.: |  |  |  |  |  |  |  |  |  |
| Quantity | 14,644 | 6,576 | 6,576 | 6,576 | 6,758 | 5,000 | 2,566 | 0 | 48,696 |
| In millions of dollars | 812.9 | 250.7 | 249.7 | 254.0 | 268.5 | 223.5 | 135.1 | 0 | 2194.4 |
| FY87 P.B.: |  |  |  |  |  |  |  |  |  |
| Quantity | 15,082 | 5,750 | 0 | 4,800 | 4,800 | 4,800 | 5,000 | 8,464 | 48,696 |
| In millions of dollars | 811.9 | 223.2 | 0 | 190.6 | 195.3 | 189.7 | 286.9 | 325.9 | 2223.5 |
| Less: Mod. Cost not in FY86 P.B.) |  |  |  |  | 13.2 | 6.9 | 97.4 | 5.4 | 122.9 |
| Adjusted FY87 P.B. (for direct comparison to FY86 P.B.): |  |  |  |  |  |  |  |  |  |
| In millions of dollars | 811.9 | 223.2 | 0 | 190.6 | 182.1 | 182.8 | 189.5 | 320.5 | 2,100.6 |
| DELTA: |  |  |  |  |  |  |  |  |  |
| Quantity | -438 | 826 | 6,576 | 1,776 | 1,958 | 200 | -2,434 | -8,464 | 0 |
| In millions of dollars | 1.0 | 27.5 | 249.7 | 63.4 | 86.4 | 40.7 | -54.4 | -320.5 | 93.8 |

**QUESTION.** Show a comparison of the expected cost savings to be realized from the All-Up-Around (AUR) strategy, then and now.

General GIANCIOLO:

| | FY85 and prior | FY86 | FY87 | FY88 | FY89 | FY90 | FY91 | To COMPL | Total |
|---|---|---|---|---|---|---|---|---|---|
| FY86 P B | | | | | | | | | |
| Quantity | 14,544 | 6,576 | 6,576 | 6,576 | 6,758 | 5,000 | 2,566 | 0 | 48,696 |
| Sole Source (S S ) estimate then | | | | | | | | | |
| S S [1] | 836.6 | 261.1 | 261.3 | 261.6 | 278.3 | 236.1 | 140.4 | 0 | 2,275.4 |
| AUR [1] | 812.9 | 250.7 | 249.7 | 254.0 | 268.5 | 223.5 | 135.1 | 0 | 2,194.4 |
| Saving then | | | | | | | | | |
| Delta [1] | 23.7 | 10.4 | 11.6 | 7.6 | 9.8 | 12.6 | 5.3 | 0 | 81.0 |
| Project manager's current estimate for fiscal year 1986 President's budget quantities | | | | | | | | | |
| Quantity | 15,082 | 6,576 | 6,576 | 6,576 | 6,758 | 5,000 | 2,128 | 0 | 48,696 |
| Sole source estimate with February 1986 escalation indices | | | | | | | | | |
| S S [1] | 856.0 | 259.3 | 250.9 | 245.6 | 262.4 | 209.2 | 94.1 | 0 | 2,177.5 |
| AUR [1] | 811.9 | 230.5 | 227.7 | 226.6 | 241.0 | 188.1 | 85.2 | 0 | 2,011.0 |
| Savings now (For fiscal year 1986 President's budget quantities) | | | | | | | | | |
| Delta [1] | 44.1 | 28.8 | 23.2 | 19.0 | 21.4 | 21.1 | 8.9 | 0 | 166.5 |

[1] In millions of dollars.

| | FY85 and prior | FY86 | FY87 | FY88 | FY89 | FY90 | FY91 | To COMPL | Total |
|---|---|---|---|---|---|---|---|---|---|
| FY87 P B | | | | | | | | | |
| Quantity | 15,082 | 5,750 | 0 | 4,800 | 4,800 | 4,800 | 5,000 | 8,464 | 48,696 |
| S S [1] | 856.0 | 248.9 | 0 | 203.9 | 210.4 | 211.3 | 309.2 | 363.5 | 2,403.2 |
| AUR [1] | 811.9 | 223.2 | 0 | 190.6 | 195.3 | 189.7 | 286.9 | 325.9 | 2,223.5 |
| Savings now (For fiscal year 1987 President's budget quantities with modifications included) | | | | | | | | | |
| Delta [1] | 44.1 | 25.7 | 0 | 13.3 | 15.1 | 21.6 | 22.3 | 37.6 | 179.7 |

**QUESTION.** Have these changes in Hellfire quantities been coordinated with the anti-armor working group? Have they been reflected in the latest version of the anti-armor master plan?

General CIANCIOLO. The anti-armor working group has been informed of changes that have occured to the Hellfire program as a result of production delays. Programmatic changes have been input to the data base that supports the Anti-Armor Master Plan.

**QUESTION.** The Congress provided $234.2 million for 6,567 Hellfire missiles for fiscal year 1986. The 1986 column of the 1987 Budget shows $223.2 million and 5,750 missiles. Please reconcile these figures.

General CIANCIOLO.

| | |
|---|---|
| For 6,576 missiles | $234.2 |
| For 5,750 missiles | 232.2 |
| Undistributed inflation reduction | 11.0 |

**QUESTION.** Provide an accounting for all uses, and their costs, to which fiscal year 1986 funds are being put.

General **Cianciolo**. Fiscal year 1986 President's Budget $223.2 million.

| | | |
|---|---|---|
| A Hardware | | $206.5 |
| 1 All-up rounds | $185.1 | |
| 2 Training missiles | 2.7 | |
| 3 Engineering change orders | 2.9 | |
| 4 Engineering services | 11.2 | |
| 5 Dummy missiles | 1 | |
| 6 Containers | 2.9 | |
| 7 De-icing kits | 1.5 | |
| 8 Ground laser laocator designator support contract | 1 | |
| B In-house | | $16.7 |
| 1 U.S. army missile command | (10.4) | |
| a Project management office support | 2.9 | |
| b Production assurance support | 5 | |
| c Laboratory support | 6.6 | |
| d Other in-house | 4 | |
| 2 Army Materiel Command | (1.5) | |
| a Explosives | 1.3 | |
| b Anniston Army depot | 2 | |
| 3 Other Government agencies (Eglin Air Force Base) | 4.8 | |

[**Clerk's note**.—End of questions submitted by Mr. Addabbo.]

## CHAPARRAL

Mr. **Addabbo**. The Army has requested $103.7 million to procure the first lot of Chaparral missiles which use the new Rosette Scan Seeker (RSS). A similar request in the fiscal year 1986 budget was denied by the Congress as premature, although funds were provided for production startup.

What is the status of RSS development?

General **Cianciolo**. Sir, the status is that the seeker is proceeding quite satisfactorily. The contractor has just completed the ninth missile firing. We have six successes out of the nine missile firings.

The latest two missile firing were at the White Sands Missile Range in very hostile countermeasure and meteorological environments against moving aircraft. They were successful.

So we feel that the program now is on track and moving successfully.

Mr. **Addabbo**. A total of 28 to 32 missle test flights are supposed to take place.

How many have taken place to date?

What have been the results?

General **Cianciolo**. Sir, the number that have taken place is nine, but those were contractor tests. The remainder of the flights will be government test flights.

Mr. **Addabbo**. Please answer the following questions on Chaparral for the record.

[**Clerk's note**.—Questions submitted by Mr. Addabbo and the answers thereto follow:]

**Question**. Provide the planned dates for the remainder of the missile test flights.

General CIANCIOLO. Twenty four test flights remain to be conducted, these flights will be flown between April and early December 1986.

QUESTION. When will an IPR take place? When does the Army expect to award a production contract?

General CIANCIOLO. An IPR is scheduled for 19 December 1986 followed by a production award in July 1987.

QUESTION. Last year, Army documentation showed that production of CHAPARRAL would be the sole source to the Ford Aerospace Company. This year's documentation shows that a production award will be competitive, with the contractor to be determined.

Please explain the Army's current plans for CHAPARRAL missile production.

General CIANCIOLO. Competitive procurement of the Rosette Scan Seeker (RSS) Guidance Section (GS) is planned based on the proven technical data package (TDP). Proofing of the TDP for RSS GS is being conducted to assure adequacy of the documentation for production. This is being accomplished by an independent validation of the TDP and fabrication of a small proof quantity. All other missile components have been previously procured competitively and successfully produced. The missile assembly will continue to be performed at Red River Army Depot. Support to the TDP and resolution of system problems will be accomplished by the system prime contractor.

QUESTION. Does the Army anticipate that lower cost will result from competition? How much lower?

General CIANCIOLO. The Army anticipates lower cost as a result of allowing the market place to establish the price. Potential savings are determined to range between 10% and 25%. Items other than GS have been budgeted based on competition.

QUESTION. When will the Fiscal Year 1986 funds provided for production start-up be obligated?

General CIANCIOLO. The following obligations have been projected:

| | |
|---|---|
| 1Q FY86 | ...... |
| 2Q FY86 | 3.5 |
| 3Q FY86 | 1.5 |
| 4Q FY86 | 1.0 |
| 1Q FY87 | 4.0 |
| 2Q FY87 | 1.5 |
| 3Q FY87 | 15.0 |
| 4Q FY87 | 10.8 |

QUESTION. Last year, Army documentation projected a unit cost of $117 thousand for an initial buy of 300 missiles. The request this year projects a unit cost of $124 thousand for an initial buy of 456 missiles.

Why has the unit cost increased, especially for a larger number of units?

General CIANCIOLO. The unit cost of $117 thousand for an initial buy of 300 missiles was based on a Design to Unit Production Cost (DTUPC) goal for two consecutive buys of 1100 and 2468 units. Subsequent to these assumptions our buys have been reduced each year. Thus caused us to develop a rate adjustment factor to apply to the learning curve model to account for lower production rates.

However, last year we initiated an effort to update our baseline cost estimate. As a part of this effort, we fund that our rate adjustment learning curve model was not a very good cost predictor for the initial low rate buys. Therefore, we developed a more refined model that overcomes this deficiency. This model is traceable to the DTUPC goal and assumptions. This model will be used as the basis for our baseline cost estimate subject to verification from an independent cost estimating team.

QUESTION. Why will the planned competition not lower projected unit cost?

General CIANCIOLO. The Army is examining a competitive acquisition strategy for RSS procurement. This strategy is pending finalization. Upon finalization it is anticipated that lower projected unit cost will result.

QUESTION. Last year's documentation projected a total requirement for nonrecurring procurement support of $30.2 million. This year's documentation shows $37.3 million for the same purpose.

Why has this activity increased by 24 percent?

General CIANCIOLO. The increase in nonrecurring procurement support cost is due to the restructuring of the RSS program to provide both retrofit of existing MIM/72C CHAPARRAL missiles with the new RSS seeker and procurement of new RSS missiles for inventory.

[CLERK'S NOTE.—End of questions submitted by Mr. Addabbo.]

## TOW-2

Mr. ADDABBO. Mr. McDade.

Mr. McDADE. Thank you, Mr. Chairman.

You are requesting $134.6 million this year to procure 12,000 TOW-2 missiles. It appears that the erratic production schedule for TOW-2 has been eliminated, and the Army now plans to hold steady at 12,000 missiles per year for the next five years.

If these problems have been resolved, why does the Army not intend to pursue a multiyear procurement? Wouldn't that save money?

They are resolved, are they not?

General CIANCIOLO. Yes, sir.

Mr. McDADE. Why isn't this a candidate for multiyear procurement? It would save money if it ws multiyear procurement, wouldn't it?

General CIANCIOLO. If the Army can demonstrate that we could save 10 percent, it would be submitted as a multiyear procurement. However, right now we are studying whether to second source TOW-2 or to go after it under multiyear procurement.

Mr. McDADE. What is the time frame for that decision, General?

General CIANCIOLO. Our under secretary is conducting a market survey to determine how much interest there is in industry to be second source producers. So far he has only had one industry representative approach him with regard to being interested in such a procurement.

I must say to you, though, sir, that the quantities to be produced are quite low with regard to second source but we expect to come to some kind of decision, I would say, within the next two months.

Mr. **McDade**. What is the procurement production rate?

General **Cianciolo**. The current procurement rate is 12,000 per year. We have facilitized to produce at 2500 missiles a month or 30,000 missiles per year. We have also provided for a surge capability to that rate.

Mr. **McDade**. Have all the quality control problems been resolved?

General **Cianciolo**. Yes, sir, they have.

Mr. **McDade**. That is good news.

Last year the Army testified that delivery schedules would be back on track by April 1986, and that delivery of fiscal year 1985 missiles would occur on schedule. Will they?

General **Cianciolo**. Sir, right now, Hughes is presently 9,000 missiles in arrears. However, they are making up the difference by producing 3,000 missiles per month and they have been able to do that and I expect that they will be back on schedule very shortly with the quality product.

Mr. **McDade**. What did you say the maximum rate is? Didn't you say the maximum rate was 2500 a month?

General **Cianciolo**. I said we had a surge capability with a rate of 2500 a month but they have produced at 3,000 a month.

The way they got there is they entered a second shift.

Mr. **McDade**. Why does the fiscal year 1987 request for TOW-2 reflect an 8.2 percent increase in flyaway unit cost over fiscal year 1986?

General **Cianciolo**. Sir, I have to provide that for the record.

[The information follows:]

The guidance for FY86 did not allow for escalation from FY85 to FY86. An additional 700 missiles were added to FY86 without an increase in funds. The only increase from FY86 to FY87 is escalation. The FY86 dollar guidance was reduced without a Congressional reduction of the TOW missiles.

Mr. **McDade**. Well, there is also a 4.7 percent increase in flyaway unit cost projected from fiscal year 1987 to fiscal year 1988.

General **Cianciolo**. I will provide that for the record also.

[The information follows:]

The 4.7 percent increase in fly away unit cost projected from FY87 to FY88 is based on escalation.

Mr. **McDade**. What efforts, if any, is the Army pursuing to increase competition, such as component breakout, in the TOW-2 program?

[The information follows:]

The TOW Project Manager has continuously pursued increased competition in procurement of the TOW 2 missile. The missile overpack, warhead metal parts, warhead body, warhead liner and boattail bushings have been broken out and competed. The M114 launch motor metal parts is presently a candidate for competition and the flight motor has just recently been qualified for second source. A study has been completed relative to a Congressional direction for competing the TOW 2 missile.

Mr. **McDade**. You are talking about a second source, General, and our information is you have been looking at that for several years. Tell us about what you are doing to increase competition on this program, breaking out components, second source, whatever. Tell us about this.

General **Cianciolo**. Sir, the TOW missile system is pretty well broken out already. The business of the second source, we have been prodded to look at that type of procurement. But the quantities funded by the program remain low and the fact that we moved from TOW to Improved TOW to TOW-2 there has been some instability in the baseline configuration, has prohibited us from looking at TOW in a multiyear mode.

Mr. McDade. You know we seem to be going back and forth. I asked you earlier about the current rate and I asked if all the quality control problems were resolved, you said they were. Now we are hearing a different song, back and forth.

General Cianciolo. No, sir. With regard to quality, the quality is back on track. Our production is good in catching up to schedule. With regard to TOW-2 second source, as I said, the Army is conducting a market survey to find out what industries are interested in competing or participating in a second source procurement for the remainder of the TOW quantities. Right now we only know of one company that has expressed interest in doing that and the reason we have been told is that the quantities to be procured are very low and do not make it attractive as a business option for other companies.

Mr. Seraphin. General, when you go over the record of the hearing, may I suggest that you put in some information which clarifies the business about the maximum production rate.

Army documentation says that the so-called 1/8/5 rate, that is one shift, eight hours a day, five days a week, is 1800 missiles per month and the absolute maximum rate is 2500. That is, I understand, even with adding a second shift.

It seems unlikely that Hughes could be building 3,000 missiles a month under those circumstances.

General Cianciolo. Sir, I could tell you that the actual deliveries have at times exceeded 3,000 a month. We will clarify the remarks in the record.

Mr. Seraphin. Thank you, sir.

[The information follows:]

The maximum production rate of TOW 2 is 2,500 per month, however, deliveries occur after fly-to-buy acceptance testing so that in any given month, deliveries to the government may be well above or below production. Actual production has been at or below the maximum rate during the 14 months since resumption of production in January 1985.

## STINGER

Mr. McDade. The Army requests $251.7 million for 4,180 Stinger RMP missiles. This year, for the first time, the Army is proposing a multiyear procurement of Stinger.

When Navy and Marine Corps requests in fiscal year 1987 for Stinger are included, the total fiscal year 1987 request is for a 49 percent increase in quantity, from 4,239 to 6,307 missiles.

What is the evidence that the contractor will be able to achieve so abrupt an increase in production?

Colonel Devanney. Sir, let me answer that.

We are ramping up now and producing a new missile, seeker for the Stinger missile, the reprogrammable microprocessor. I believe that there should be no problem in ramping up to the quantities we are talking about in that we have produced Stinger at fairly high rates in the past.

Mr. McDade. What evidence do you have that you can have a contractor deliver such a large increase? What evidence do you have? Are there any new lines outstanding, something going on you can tell us about?

Colonel Devanney. We have to facilitate to be able to produce at that rate.

Mr. McDade. What is the rate that the contractor is facilitized for in the fiscal year 1986 program?

Colonel Devanney. Sir, I have to provide that information for the record.

General Cianciolo. We will provide that for the record.

Mr. McDade. What funds are included in this fiscal year 1987 budget to increase that rate? Do you know?

General Cianciolo. I will have to provide that for the record.

Mr. McDade. Tell us what the new rate will be as well.

The Fiscal Year 1986 budget was to facilitize the contractor to 600/mo on 1-8-5 shift; however, due to the Gramm-Rudman cuts, the current plan is to produce the 4239 RMP missiles on a two shift basis. The current facility rate on a 1-8-5 basis is 400/mo. There are no additional facility funds included in the Fiscal Year 1987 budget.

Mr. McDade. Please answer the following questions for the record.

General Cianciolo. All right, sir.

[Clerk's note.—Questions submitted by Mr. McDade and the answers thereto follow:]

Question. If the 1-8-5 is 400 per month or 4800 per year, why are two shifts needed to build 4239 FY 1987 missiles?

General Cianciolo. The FY 1986 program requires the 4239 missiles to be delivered in 8 months with a peak rate of 575 missiles per month as opposed to the 400 per month of the FY 1985 contract.

Question. What is the 2 shift production rate in the current facility?

General Cianciolo. The existing facility is a STINGER basic product line, however, current contracts (FY 1985 RMP) stipulate General Dynamics reach a production rate capability of 400 per month on a 1-8-5. This rate capability has always been qualified that selected second shift operations would be necessary.

It is anticipated that, during the FY 1985 contracts, General Dynamics could reach rates of 600 per month utilizing second shift operations, however, several new pieces of test equipment will be necessary because only one copy exists.

As the production line matures and yields stabilize, rate capability will increase.

Question. Does this answer say that no FY 1986 funds have been or will be spent on facilitization?

General Cianciolo. No, as rate goes to 575 per month, several pieces of test equipment will be added to preclude down time risk.

Question. Does this answer say that the FY 1987 missiles will be built in a facility which will have a rate on a 1-8-5 bases of 400 per month?

General Cianciolo. Yes.

Question. Last year, the Army reported a yield rate of 7 percent for the ultraviolet detectors used in STINGER. What is it now?

What must it be to support the buy of 6,307 missiles proposed in the Fiscal Year 1987 budget?

General CIANCIOLO. The current yield rate on ultraviolet detectors is 9 percent which is adequate to support the buy of 6307 missiles proposed for the Fiscal Year 1987 budget. The yield rate is expected to increase to 12 percent by the time Fiscal Year 1987 deliveries start (Mar 89). The 12 percent yield is cost effective for meeting the production rates anticipated for STINGER-RMP.

QUESTION. Last year, the Army stated that second sources for ultraviolet detectors were being established. Have they been? Provide details.

General CIANCIOLO. Second sources for detectors are currently under contract to Eagle Picher and Cincinnati Electronics. The ongoing efforts are on schedule, without major problems. The current status is:

a. Eagle Picher—Scheduled to complete UV detector qualification in December 1986. Eagle Picher is the current supplier of detector grade cadmium sulfide material.

b. Cincinnati Electronics—Scheduled to complete UV detector qualification in December 1986 and dual detector qualification in February 1987.

[CLERK'S NOTE.—End of questions submitted by Mr. McDade.]

Mr. MCDADE. The Stinger procurement request includes $42.9 million for 20 Pedestal Mounted Stinger (PMS) units. Last year, the Congress provided $5 million above the budget to pursue development of PMS, and denied procurement funds, in the belief that even a non-developmental item (NDI) had to be tested for operational suitability and effectiveness.

What use has been made of the $5 million provided for the purpose?

General CIANCIOLO. Sir, we are going to go out with a competitive REP to solicit industry to proceed a Pedestal Mounted Stinger system to be competed.

The competitive test part of that non-developmental item procurement will include safety release assessments, stationary tracking of aricraft, tracking aircraft while Pedestal Mounted Stinger is on the move. Each candidate will fire one missile while the Pedestal Mounted Stinger is on the move. They will also be tested in environmental chambers. There will be mobility and endurance tests and also there will be tests on electromagnetic radiation operation.

So it is quite an extensive test that we have ongoing that will take place with the RDT&E money provided by the Congress in the last year, and some RDT&E money we are requesting this year about $3 million and then the procurement dollars of course will be used to procure this NDI item after they have completed testing.

Mr. MCDADE. You will not get into procurement until you have had these tests?

General CIANCIOLO. That is correct.

Mr. MCDADE. The request for PMS procurement results in a unit cost of $2.15 million. How can a PMS cost as much as an M1 tank? Please provide the details of how this request was derived.

General CIANCIOLO. If I could just briefly answer. Our goal is to obtain under a $1 million average unit cost. We hope that competition will be a strong motivator although FY 87 first year procurement unit cost will be higher than unit costs further out on the learning curve to get that cost estimate down from $2.1 million.

So it is our intent to procure a system that is significantly lower than the cost estimate that you have just stated, sir. We hope to do that through competition.

Mr. McDade. We don't want you going into procurement until we have got the testing done. We don't want to goldplate it.

Please answer the rest of the questions on Stinger for the record.

[Clerk's note.—Questions submitted by Mr. McDade and the answers thereto follow:]

Question. The STINGER procurement request includes $42.9 million for 20 Pedestal Mounted STINGER (PMS) units. Last year, the Congress provided $5 million abover the budget to pursue development of PMS, and denied procurement funds, in the belief that even a non-developmental item (NDI) had to be tested for operational suitability and effectiveness.

What use has been made of the $5 million provided for the purpose?

General Cianciolo. Subject $5.OM RDT&E monies were reduced to $5.OM as directed by combined program reduction. This $4.OM is being used to conduct the LOS-R candidate NDI test and evaluation starting 28 August 1986.

Question. How can procurement funds be justified before thorough testing data is in hand?

General Cianciolo. The Army has conducted a market survey for candidate systems and in fact has already tested two candidates. The Army is confident that systems are available as NDI candidates that meet Army requirements. The candidate T&E to be conducted starting in Calendar Year 1986 is not to determine if systems are available but to determine in conjuction with the evaluation of contractor responses to the RFP which available candidate should be selected for production.

Question. The request for PMS procurement results in a unit cost of $2.15 million. How can a PMS cost as much as an M1 tank? Please provide the details of how this request was derived.

General Cianciolo. Initial hardware cost was estimated to be $1.2M for PMS. This estimate was for first unit buy—worst case i.e. non-competitive environment. The current acquisition strategy requires full and open competition which should drive the cost down. The $2.15M was total program cost, not hardware. The average cost for the total Army request should average approximately $1M each.

Question. The budget includes a request of $40.3 million for STINGER Advance Procurement. No such request has been made in the past.

Why is this request made?

General Cianciolo. The advance procurement request is related to the Army's multi-year funding request submitted for the first time this year. The $40.3M is broken down as follows: Fiscal Year 1988-$21.4; Fiscal Year 1989-$7.1; Fiscal Year 1990-$6.3; Fiscal Year 1991-$5.5. The major advantage of a multi-year procurement is to provide suppliers the incentive to capitilize production facilities, thereby providing the most economical order quantity with minimal set up requirements. The $40.3M reflects the quotes from the suppliers as a result of the multi-year scenario.

**Question**. What specifically is proposed to be purchased?

General **Cianciolo**. Due to single purchase order procurement of multi-year quantities, a substantial portion of the total requirement will be purchased up-front. The following schedule was used:

| Commodity Group: | *Years* |
|---|---|
| A7, 03, 10 | 1 |
| 07, 12, 14, 15, 17, 42 | 3 |
| 04, 05 | 5 |

Commodity classifications are as follows:

| | |
|---|---|
| Electrical, Module, & CCA Material | A7 |
| Special Order Small Parts | 03 |
| Special Order Major Items | 04 |
| Special Order Major Items | 05 |
| Diodes, Transistors, Crystals | 07 |
| Raw Materials | 10 |
| Castings & Forgings | 12 |
| Std. Minor & Major Electronic Items | 14 |
| Std. Minor & Major Hydro Mechanical Items | 15 |
| Electrical, Module, & HMA Material | 17 |
| Plastic & Metal Parts | 42 |

**Question**. Have binding cost proposals been received from the contractor for a multi-year buy of STINGER?

General **Cianciolo**. The contractor has received proposals from his subcontractor and has submitted a proposal to the STINGER PMO. Based on these proposals, the STINGER PMO submitted the final multi-year request to OSD.

**Question**. Over how many years, and for what quantities, is a multi-year buy proposed.

General **Cianciolo**.

| | Fiscal year | | | | | |
|---|---|---|---|---|---|---|
| | 1987 | 1988 | 1989 | 1990 | 1991 | Total |
| Missiles | 6,307 | 7,864 | 8,198 | 8,134 | 7,119 | 37,622 |
| Gripstocks | 3,427 | 5,200 | 3,275 | 3,317 | 2,219 | 17,438 |
| Tracking head trainer | 111 | 156 | 88 | 153 | | 508 |

[**Clerk's note**.—End of questions submitted by Mr. McDade.]

Mr. **McDade**. Thank you, Mr. Chairman.

Mr. **Addabbo**. The gentleman from Pennsylvania, Mr. Murtha.

### PATRIOT

Mr. **Murtha**. Let me ask about the Patriot, General. The Army requested $951.5 million for Patriot, to include 12 fire units and 700 missiles.

When foreign military sales are considered, the projected totals go to 15 fire units and 810 missiles. This year, for the first time, the Army is proposing a multiyear procurement of Patriot.

What is the basis for your belief that Patriot is ready for multiyear procurement?

General **Cianciolo**. Sir, Patriot has been in production for quite sometime and it has a very stable configuration, and it is doing very well with soldiers in the field—we have received an unsolicited proposal from Raytheon for a multiyear contract for the Patriot system and we are in the process of working with Raytheon to issuing them an RFP to propose a multiyear contract.

[Additional information follows:]

Based on an assessment of the following criteria, PATRIOT is ready for a multiyear procurement:

a *Benefit to the Government.*—Multiyear procurement provides significant benefits to the U.S. Government. Even though PATRIOT has experienced seven negotiated production contracts (FY80-FY86), the multiyear environment for the procurement period FY87 through FY91 can still produce $314.8M of cost avoidance. In addition, a Firm Fixed Price (FFP) contract will be used to limit government financial risk.

b *Stability of Requirement.*—The total inventory and acquisition objectives for PATRIOT have remained essentially unchanged since initiation of production in 1979. The overall requirement is expected to remain unchanged.

c *Stability of Funding.*—The PATRIOT Program should experience funding stability equivalent to overall Department of Defense funding stability. PATRIOT has enjoyed high priority among the Army major acquisition programs. PATRIOT is a key part of the modernization of NATO Air Defense and the highest levels of the Department of Defense have supported international cooperative air defense programs which are dependent on funding stability.

d *PATRIOT Configuration Stability.*—The PATRIOT system is now in an era of configuration stability. The corrective actions required for the problems identified prior to and during the Follow On Evaluation III (FOE III) and the initial fielding problems have been incorporated or are planned for incorporation prior to FY86 production. The backlog for normal production problems has been significantly reduced so it now reflects those levels which would be expected to be encountered by a program of this size in the steady-state. These include items which involve times through test, normal actions to respond to vendor base changes, and those which have minor configuration change impact and are readily resolved.

e *Degree of Cost Confidence.*—PATRIOT experience to date includes Production Buys #1 through 7 (FY80-FY86). Deliveries are complete for the first three of these buys. The multiyear estimate has been developed by intense interface with the prime contractor's vendor base and a detailed analysis of the benefits of the multiyear environment. The test of the multiyear estimate and the definition of attendant savings is derived through comparisons with the historically developed program Baseline Cost Estimate (BCE).

f *Degree of Confidence in Contractor Capability.*—PATRIOT is presently on or near delivery schedule. Through FY86, over one-half of the production program has been delivered or is under contract. The system reliability for deployed units is over 1.5 times the government specification. In summary, the contractor has demonstrated a high degree of capability and competence in producing a major U.S. Army weapons system that meets or exceeds performance requirements, and whose costs and schedule are on target.

Mr. MURTHA. There have been slips in the delivery schedule. Have these problems been resolved? What is the current status of delivery, both of missiles and of fire units?

General CIANCIOLO. The problems have been resolved, and they are delivering both missiles and fire units.

Mr. MURTHA. It is on schedule now?

Colonel DEVANNEY. Missile deliveries will be back on schedule by fourth quarter FY86. Fire units the same.

Mr. MURTHA. Have binding cost proposals been received from the contractor for a multiyear buy?

General CIANCIOLO. We received an unsolicited proposal from them and it is the intent of the Army to resubmit to the contractor a request for proposal for multiyear since their unsolicited proposal was not complete to the Army's satisfaction. So the answer to your question is no.

Mr. MURTHA. Over how many years, and for what quantities, is a multiyear buy purposed?

General Cianciolo. The multiyear is over a five-year period. It is to procure 33 fire units and 3,862 missiles.

Mr. Murtha. Last year the Army requested $983.4 million for Patriot procurement for fiscal year 1986. The Congress provided $963.4 million.

The fiscal year 1986 column of the fiscal year 1987 budget now shows $928.1 million for the identical budgeted buy of 12 fire units and 585 missiles.

Was this a case of severe overbudgeting?

General Cianciolo. No, sir. It was a result of the increased cost avoidance through the multiyear contract so the fiscal year 1987 budget submitted reflects those savings.

[Additional information follows:]

The difference in the dollars provided by Congress and those now shown is in inflation adjustments. Since the inflation rate did not increase as much as originally estimated, the funds were not required.

Mr. Murtha. Does the Army intend to use fiscal year 1986 Patriot funds as a source for reprogrammings?

General Cianciolo. I don't believe so, sir.

Mr. Murtha. What happened to the $35.3 million, the difference between what the Congress provided and what is now shown? Please provide a specific accounting.

General Cianciolo. Talking about the difference between the 1987 column and 1986 budget and the 1987, it has to do with regard to multiyear savings, I believe.

Mr. Seraphin. General, the Congress appropriated $35 million more than you are showing in the 1986 column of the 1987 budget. Mr. Murtha's question is, where is that $35 million? What are you doing with it?

General Cianciolo. I misunderstood your question but I don't have the answer. I will have to provide it for the record.

[The information follows:]

Congressional Record Number 177, December 19, 1985, directed a total reduction of $128.4 million in the Fiscal Year 1986 Missile Procurement, Army Appropriation as Fiscal Year 1985 Inflation Re-estimation, Fiscal Year 1986 Inflation Fairness Adjustment. The $35.3 million reduced from the Fiscal Year 1986 PATRIOT appropriation was the PATRIOT pro rata share of these general reductions.

Mr. Murtha. Let me make a suggestion that this might be one place you use the contra money; we are not going to go along with the ammunition as a source. That is something to keep in mind if there is $35 million here, that is a place for reprogramming, in my estimation.

Answer the following questions on Patriot for the record.

General Cianciolo. Yes, sir.

[Clerk's note.—Questions submitted by Mr. Murtha and the answers thereto follow:]

Question. The fiscal year 1987 request for PATRIOT procurement includes items which have not previously appeared in the budget. The sum of $35.2 million is requested for "Software Engineering".

Please Explain this item. What is to be purchased, and why?

General Cianciolo. The funds will be used to fund contractor and in-house software engineering tasks as follows:

Design, code and test software changes for operational, training and software for post-deployment builds; conduct comprehensive validation tests, investigate field problems and develop software requirements. Release builds to the field (290,000 manhours, $18.8M).

Continue build-up of in-house manpower working toward transition of Life Cycle Software Engineering (LCSE) responsibilities in FY88 (280,000 manhours, $13.2M).

Question. How was the figure of $35.2 million derived?

General Cianciolo. The estimate was developed utilizing over five years of software engineering cost history. The estimate of system contractor costs compares favorably with those estimated by cost models for embeded software.

Question. Why is Software Engineering included in a procurement request? Why isn't it budgeted under RDT&E?

General Cianciolo. Life Cycle Software Engineering is for the engineering effort in support of product improvements to the PATRIOT system that do not increase the performance envelope of the system. RDT&E appropriation is proper when the performance envelope of a system is increased. The Procurement Appropriation is proper for production engineering support of investment type items currently in production. Fiscal Year 1984 and Fiscal Year 1985 request for this effort were included in the Operation and Maintenance, Army Appropriation per guidance from the Comptroller, Office of the Secretary of Defense. In January 1985, the Office of the Comptroller of the Army made a determination to change the appropriation to Missile Procurement, Army since the work being performed could not be construed as maintenance in support of investment items out of production.

Question. The sum of $45.3 million is requested for Advance Procurement. Why is Advance Procurement required for PATRIOT, when it has not been in the past?

General Cianciolo. Fiscal Year 1987 Advanced Procurement in the amount of $45.3M is for Economic Order Quantities in support of the PATRIOT Multiyear Procurement request.

Question. What specifically is proposed to be purchased? Please provide a detailed listing, showing items and their costs.

General Cianciolo. Advanced procurement items to be procured in support of the Multiyear Contract are as follows:

[Dollars in millions]

| | Fiscal year | | |
|---|---|---|---|
| | 1987 | 1988 | 1989 |
| Material | | | |
| Casting | 4.7 | 5.4 | 1.6 |
| Connectors | 8.5 | 8.8 | 6.5 |
| Capacitors | 2.7 | 3.2 | 1.8 |
| Magnetics | 3.7 | | |
| Semiconductors | 26.2 | 22.7 | 27.5 |
| Total | 45.3 | 40.1 | 37.4 |

[Clerk's note.—End of questions submitted by Mr. Murtha.]

### 10-TON TRUCKS

Mr. MURTHA. Let me ask some questions on ten-ton trucks.

The budget includes $234.3 million for procurement of 1,523 ten-ton trucks. The Army has been buying these trucks under a five-year competitively awarded multi-year contract, which ended in fiscal year 1985. In fiscal year 1986, additional trucks are being procured using available options on the original contract. What is the procurement strategy for the fiscal year 1987 procurement?

General THOMAS. Our procurement strategy for fiscal year 1987 is a sole-source procurement to Oskosh, that will be a sole-source procurement for 1523 vehicles.

Mr. MURTHA. What is the justification for sole source?

General THOMAS. Sir, I would like to, if I could, address that in terms of the family of heavy tactical vehicles and what we are doing there.

Could I have that slide No. 7507?

We, first of all, we do not have a TDP for the ten-ton truck, and last year we testified that we would have a ten-ton rebuy program. We have done considerable experimentation with the palletized loading system and have looked at the concept of a family of heavy tactical vehicles.

That family concept study was matured this year, and we have concluded that our requirements would be best served by family of heavy tactical trucks rather than a ten-ton rebuy.

This shows the deliveries through the 1988 period. We have attempted to commence with prototype testing, which is a non-developmental approach. We will procure prototype vehicles with RDT&E money, test the vehicles from the competitive——

Mr. MURTHA. How many trucks are you talking about now?

General THOMAS. In the test, sir?

Mr. MURTHA. In the sole-source buy?

General THOMAS. In the sole source, to continue to fill the gap until that is completed, there is 1523 in the request for fiscal year 1987.

There is an option to that sole source for fiscal year 1988 of 396 vehicles. Basically, that closed the period during the prototype testing of the family of heavy tactical vehicles which would then commence in the 1989 budget submissions.

### USE OF SOLE SOURCE

Mr. MURTHA. What is the advantage of being sole source? I realize there are cases where competition is counterproductive. But this is a pretty big buy and a lot of money. How can you justify the sole source in this case?

General THOMAS. Sir, if I recall, we do not own the technical data package for this particular vehicle and if we went without the technical data package of course we would end up with a completely different vehicle for logistic supportability.

Mr. MURTHA. Is this an off-the-shelf buy? Initially, didn't they have some problems with this?

General THOMAS. Yes, sir.

Mr. MURTHA. Ten ton?

General THOMAS. Yes, sir.

Mr. **Murtha**. You went into them with a set of specifications; it was basically off-the-shelf buy, is that right?

General **Thomas**. Yes, sir, it was an NDI, if you will, but it was an assembly of components that were existing in the marketplace off the shelf.

Mr. **Murtha**. Are you satisfied now with the truck? Is it working all right? Do you have any problems with it out in the field?

General **Thomas**. Sir, we are satisfied with the truck. As you know, the axle problem is fixed and the crane problem is fixed, and we are satisfied with the truck, yes, sir.

Mr. **Murtha**. I know sometimes these competitions cost you more money. How do you avoid competition even though you feel justified in giving a sole-source contract?

General **Thomas**. Right now it would be a readiness issue in that the conversations we have had with industry have indicated that if their proposed competition, if you will, would lead to an 18-month period of time before the source selection of the next ten-ton vehicle that would be competing.

Mr. **Murtha**. You are saying that you would have to wait 18 months before you could get the vehicles, is that what you are saying?

General **Thomas**. We would have a break in deliveries to the Army between 12 and 18 months; I tend to believe it will be more.

### SIZE OF TRUCK BUY

Mr. **Murtha**. What is the total buy for ten-ton trucks?

General **Thomas**. In this particular contract?

Mr. **Murtha**. Overall, how may will you buy?

General **Thomas**. The AAO for the Army is 20,244.

Mr. **Murtha**. How many have you bought so far?

General **Thomas**. We have bought to date, close to 7,000. With the fiscal year 1987 buy that will raise us to approximately half of our AAO, as you know.

Could I have that 7505 slide, please?

[Slide follows:]

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# TACTICAL TRUCK FLEET

| B236.91 | IN THE FIELD | BEING FIELDED | TO BE FIELDED |
|---|---|---|---|
| LIGHT | 1/4T M151<br>1/2T M274<br>1 1/4T M561<br>1 1/4T M880 | HMMWV<br>CUCV | NEW COMMERCIAL<br>1 1/4T [illegible] |
| MEDIUM | 2 1/2T M44 | | NEW [illegible] |
| MED HEAVY | 5T M656<br>5T M39<br>5T M809 | 5T M939 | [illegible] |
| LINE HAUL | 5T M52<br>5T M810 | M915A1 | M915A2 [illegible]<br>FY86 |
| HEAVY | M915<br>GOER | HEMTT | NEW [illegible] |

General Thomas. One of the things that we enter into as we move over time, we never completely have one thing total in the force. We have in the field today, in the line haul area, you can see some of the old goers are still out there today. We are short cargo and fuel-carrying trucks. The ten-ton is filling that.

As we move down, the Family of Heavy Tactical Vehicles will replace that. It is a bow-wave effect.

Mr. Murtha. Let me get to the basic problem that I am trying to get an answer for.

Why would the gap make such a difference that you would have to go sole source? For instance, if you have an 18-month gap, how is that going to affect your readiness that you need to go forward with sole source?

Obviously, you feel that you are justified in going forward, and you are concerned about the 18-month gap. What is the problem with the 18-month gap? What does that do to our readiness that makes you make a sole-source decision?

General Thomas. Sir, we would not have over 1,500 trucks, actually with 18-months more than that—closer to 1,900 trucks, not available in the inventory as the aging of the older trucks continues.

Mr. Murtha. You are short right now, you are short of trucks or you have trucks that should be out of the inventory that have passed their useful life; is that what you are saying?

General Thomas. Yes, sir.

Mr. Murtha. So, consequently, you would have a gap of 15 months or 18 months that you wouldn't be able to replace those trucks and so consequently it reduces your readiness; is that what you are saying?

General Thomas. Yes, sir. It keeps our readiness from improving.

Mr. Murtha. What do you figure the competition would do to the price of the truck? For instance, eventually, you are going to have competition for the other 10,000; what will that do? Will you get a better price? Do you have any idea at this point? Has anybody accepted your proposals?

General Thomas. Sir, we have not solicited for competition. We have had offerings informally from one industrial source. I can't answer the questions for the pricing. I will have to provide that for the record.

The other point, I might add, sir, is that if we do delay the 18 months, we would then push into the Family of Heavy Tactical Vehicles. In other words, that gap carries on over time.

[The information follows:]

The solicitation for the prototype development contracts for the Family of Heavy Tactical Vehicles (FHTV) is planned to be issued during the fourth quarter of fiscal year 1986. Prototype testing in support of production contractor source selection will be conducted during fiscal years 1987 and 1988. The test results and source selection process will then form the basis for determination of a definitive price for the FHTV. Procurement begins in fiscal year 1989.

Mr. Murtha. Do you have a set price for these trucks? In other words, these 1523 trucks are carried on a set price.

General Thomas. Sir, we will be negotiating, we would negotiate that in the sole source.

Mr. MURTHA. Now, in other words, they haven't given you the option to buy those 1523 trucks inside the multiyear so you may in fact have to pay a higher price if you want to buy them?

Is it possible you could get them at the same price?

General THOMAS. Sir, it is our intent to negotiate that with that position in mind, yes, sir.

### NEW HEAVY TACTICAL TRUCKS

Mr. MURTHA. The Army will begin providing a new family of heavy tactical trucks in fiscal year 1989. How will this truck differ from the current truck?

General THOMAS. Sir, the concept of the Family of Heavy Tactical Vehicles is to commence in fiscal year 1987 with the prototype testing and have industry bring their best candidates to the test, and we are not going with strict standards on this; we are going to performance specifications.

We are not going to absolutely dictate it be a ten ton. It could be a combination of vehicles between 8 and 14 tons, and it will also include the palletized loading system equipment and the idea here is to capture the best available ideas within industry and at the conclusion of the prototype testing, to conduct a source selection.

Mr. MURTHA. What are you looking for that is different in the present ten-ton truck?

General THOMAS. First of all, palletized loading system is different, and the concept that maybe we don't require every truck to be ten ton. We may have a better combination offered to us that is cheaper if some of them can be eight tons, and some of them can be 15 tons, so the mix has to do with that and could have a very substantial price differential.

Mr. MURTHA. What is the procurement strategy for new trucks?

General THOMAS. Procurement strategy is a nondevelopmental strategy with prototype testing of two years in duration.

I might add we currently have a concept evaluation ongoing at Fort Hood where we have procured the palletized loading system vehicles to explore that concept because we believe it will save manpower spaces in the logistics arena that can be applied to the combat force structure.

Mr. MURTHA. How many trucks are you talking about during that time frame? How many overall are you talking about procuring under this new procurement strategy? How many trucks are you talking about?

General THOMAS. Sir, that right now would have to be defined in the context of the classification of vehicles. In other words, if it is an eight-ton, 15-ton mix, it would be one number, but it is designed to replace the current 20,000 AA. We suspect, however, it will be less than the current 20,000.

Mr. MURTHA. Does it make sense to postpone the HEMTT purchase until after you get this work out?

General THOMAS. We don't believe it does because of the impact on unit readiness.

Mr. MURTHA. The ten-ton truck budget decreases to $70.4 million and 396 vehicles in fiscal year 1988. Explain this sharp drop in procurement quantity.

General **Thomas**. Sir, that is a ramp down of the production in FY 88 which is an option would be built in as an option to the sole source we have been discussing for 1987 in preparation for the movement to the Family of Heavy Tactical Vehicles.

Mr. **Murtha**. Assuming a mid-fiscal year 1989 contract award for the new truck, when would you expect deliveries to begin?

General **Thomas**. We would expect deliveries on this since it is a prototype to commence one year later in 1990.

Mr. **Murtha**. Why is the fiscal year 1987 budget greater than last year's projection by 568 vehicles and $73.2 million?

General **Thomas**. Sir, that increase as last year was our intent to procure as we testified a rebuy of the ten ton. This reflects not a long-term rebuy of ten ton but what we feel are immediate needs on that one year plus the option buy.

Mr. **Murtha**. Thank you, Mr. Chairman.

Mr. **Addabbo**. The gentleman from Ohio, Mr. Miller.

### MISSILE CAPABILITIES

Mr. **Miller**. Thank you, Mr. Chairman.

General, we speak of missiles in the classified and unclassified areas of the material that we have here. I know the Hellfire, the Chaparral, the Stinger, all of these, but maybe you could give us a little rundown on all of your missiles. Can we do that in this type of meeting, a rundown of the guidance system, a rundown of the speed of the missile, a rundown of what they do?

You have certain missiles for certain missions, such as anti-tank missiles, air defense missiles, and so forth. Can this be discussed that in this type of meeting?

General **Cianciolo**. Yes, sir. We can do that. If you would like, I will go through them in a category quickly and start with the air defense missile systems that are procuring.

Mr. **Miller**. If you could give us a little detail on the guidance systems as to how they work.

Let me, before you even start on that, bring up another question about the accuracy of missiles. You spoke earlier of one that shot down a fighter plane. You had a test and it worked fine. Now, if the guidance system is that good, and we can guide in and hone in on a tank, and we have 1,000 missiles, and we have 500 tanks, it looks like there is a lot of the other equipment we don't need. If we can throw the missile at the tank and the guidance system is so good that we are going to destroy that tank, then it seems the missile is the way to go. Yet we have a lot of other weapons systems. Maybe I am missing something, but that is why I wanted a little rundown on each one. What kind of guidance system? How accurate are we talking about? What distance can they go? What speed?

I know it would require a volume if you went into all that detail, but would you skim it at least, to give us a better understanding? I would appreciate it.

General **Cianciolo**. Yes, sir. I will do my best to go through them quickly. But to address your question with regard to proper mix of weapons, if a missile has such a high degree of accuracy, that it can engage target at greater range, why do we need a plethora of other systems? Unfortunately, sir, the world does not stay stagnant. Although we are clever in finding how to use electronic technology to seek out targets at great ranges and with great precision, every time we commit to a guidance system there is someone who sets out to defeat that guidance system. We find ourselves in a constant race to maintain a credible capability when we have all sorts of information that our credible capability is threatened by some countermeasure.

So it is important that you recognize that we have to continue to improve and seek the technology necessary to keep our electronics in a superior situation. That is why, as I go through these, I hope I can touch on them briefly. I don't want to go through a long tutorial. If you want more information please stop me, sir, and I will do the best I can.

[Additional information follows:]

Another problem with having the same number of missiles as targets is knowing where on the battlefield to place those missiles to counter the enemy when he masses for a main attack. Even with many more missiles than targets we can find ourselves at critical times and places on the battlefield with insufficient missiles availabe to counter the thrust. We have tried to take this into consideration in determining our requirements.

## PATRIOT

General **Cianciolo**. The first system is the Patriot missile system. It is an air defense missile system. It has command guidance, its radar tracks the missile, on its way to the target, tracks the target and missile at the same time. It has reaction time of ———.

So it is a very sophisticated air defense system. It has as lot of sophisticated software in order to allow it to operate in a very severe countermeasure environment.

The next system is the improved Hawk.

Mr. **Miller**. Could we have maximum speed of that particular missile?

General **Cianciolo**. It is a very fast missile, sir, but I don't know if I have the precise——

Mr. **Miller**. Could you furnish that for the record, please?

General **Cianciolo**. Certainly could, sir.

[The information follows:]

The maximum speed of our missile systems is as follows: ———

The maximum velocity of each of the missiles is a function of its mission requirements and weight. The air defense weapons; PATRIOT, HAWK, STINGER, and CHAPARRAL are designed to intercept fast moving aerial targets at ranges which vary from ——— depending upon the type of missile. The MLRS requires its maximum velocity to gain the required range. The Pershing II also attains high maximum velocity because of range requirements and trajectory. The anti-armor weapons (TOW, HELLFIRE) have the slowest maximum velocities because of their relatively short range requirements and because of their targets' relatively limited maneuverability.

Check range for classification.

## HAWK

General **Cianciolo**. Next weapon is the Hawk missile system. It is a weapon system that has been in the inventory for a very long time, since back in the early 1960s. It has been improved throughout the years. It is a low and medium altitude air defense system. It uses an illuminator radar to lock on and track the target. It has a semi-active homing device onboard the missile which is a radar receiver that seeks energy reflected off the target and then flies to the target.

The word "Hawk" is really an acronym that means homing all-the-way killer.

It has an maximum engagement range of ———. It has a maximum altitude engagement of ——— and phase three modifications will provide for simultaneous engagements of up to six aircraft per fire unit.

Mr. MILLER. If I may interrupt, General, let's make sure we know what we are talking about when you say reaction time.

General CIANCIOLO. Yes, sir. I mean the time from when the target is detected until a missile is fired at it.

Mr. MILLER. Detection and then engagement?

General CIANCIOLO. The acquisition radar picks up the target, the target is identified and tracked, by the IFF system and the illuminator, and then engaged by pressing the fire button ——— after detection.

Mr. MILLER. The clock starts while the missile is still in the barrel, or are you talking about after the missile is out and picks up the target.

General CIANCIOLO. No, it starts before the missile is launched; it has to include the acquisition, designation, lock on, and the launch.

Mr. MILLER. ———?

## STINGER

General CIANCIOLO. Yes, sir. The Stinger missile is a man portable air defense missile. It uses infrared homing. It has a seeker onboard the missile that picks up the heat of the target, the operator knows that he has a lock on when he gets a tone in his ear. The operator holds the missile up and points it at the target. He gets a tone in his ear that indicates that the missile is locked on that target, and then he fires it. The missile has a maximum range of ———.

The maximum engagement attitude is ———, and it allows for engagements in all aspects.

Mr. MILLER. Are of these, General, line of sight systems, that the target would have to be line-of-sight in order to be detected.

General CIANCIOLO. The Stinger is line-of-sight because the operator must see the target and identify the target before he can engage it.

Mr. MILLER. All of the rest are not necessarily line of sight; they can be over the hill?

General CIANCIOLO. No, sir, because they use radar for their target acquisition, Hawk and Patriot must have an uninhibited line from the weapon to the target. The target may be located beyond visual range, but the systems I have described are all line-of-sight weapons.

Mr. MILLER. Before we move on to the next one, it was mentioned in connection with several of them that you can engage so many targets at one time. What do you mean by that?

General **Cianciolo**. I mean that the electronics and software will permit the simultaneous engagement of more than one aircraft. As an example, a TOW missile system is a wire guided missile. When the operator fires the TOW missile system, he is committed to that target and, although he may see 20 other targets, he cannot engage another target until he has finished the first target engagement.

Mr. **Miller**. Would you clarify that? When he finishes the first target engagement——

General **Cianciolo**. Because he must command guide, he also must command guide the round all the way to the target.

Mr. **Miller**. And destroy the target?

General **Cianciolo**. Yes, destroy the target.

Mr. **Miller**. What is left then for the next target?

General **Cianciolo**. Then he goes through the same type of procedures he did to engage the first target with a new missile. Okay?

If I could go back to Stringer, Stinger as we said before, we have continued to product improve the Stinger so the missile system will have a capability in a very severe countermeasure environment.

That is why we are developing a reprogrammable microprocessor, so that we can defeat not only present day known countermeasures, but also future countermeasures which are now still under development.

## CHAPARRAL

The Chaparral missile system is an air defense missile system. It uses visual and FLIR for target detection and its guidance is infrared. The Rosette scan seeker missile has a range of ———, and will have a maximum altitude capability of ———. It is mounted on a tracked vehicle.

We have proven that Chaparral is a very successful point target defense system for air defense.

## PERSHING II

With regard to artillery missile systems, we have the Pershing II which of course is a nuclear missile and has an extended range of 1800 kilometers. It has accuracy across that range band of ———.

Mr. **Miller**. The purpose of those missiles would be deployment in Europe?

General **Cianciolo**. Yes, sir. They are all deployed in Europe.

We have fielded three Pershing missile battalions in Europe and one in CONUS. Each one of those Europe deployed battalions have sent soldiers back to the United States, either to White Sands or Cape Canaveral, where they have fired an operational missile minus the nuclear warhead. These operational firings have been conducted in a readiness exercise to demonstrate that the units are fully trained and the missiles are operationally ready.

Mr. **Miller**. Mr. Chairman, I know I have used my time. Would you prefer that we not pursue this, or would you rather it would be done for the record?

Mr. **Addabbo**. You stop pursuing it when you are satisfied the question has been answered.

Mr. **Miller**. Thank you.

General **Cianciolo**. Would you like me to continue?

Mr. **Miller**. Thank you, if you would.

General **Cianciolo**. Another artillery weapon system is the multiple launch rocket system. It is an area fire weapon used by the artillery. It has a range of ———, it carries 12 rockets onboard each launcher. Each rocket contains 644 improved conventional sub munitions which can be delivered within less than one minute.

It is used in counter-battery fires against enemy artillery. That is its primary mission ———.

It is currently deployed in the United States Army. We have 16 batteries in the force. We started to field the units in 1983 and have been fielding a minimum of six batteries per year to a maximum of nine batteries per year.

### HELLFIRE

We have in being also the Hellfire missile. I am transitioning now from artillery to anti-armor—the Hellfire missile is a laser-guided missile. It is used on the attack helicopter. It has a range of ——— if it is fired in the autonomous mode. That means the helicopter gunner fires his laser missile at a target. He can shoot ——— away, if it is used in what is called an indirect fire mode, where another laser designator provides the laser energy on to the target that the laser seeker of the missile can acquire. Then the range is ———. Its CEP is measured in inches. In other words, it has a very high accuracy against the target. It is a very lethal tank killer and will be operational in our inventory next month, in the month of April, when we field the first Apache attack battalion in the Army.

We also have the TOW-2 missile system. TOW-2 missile system is anti-tank, wire guided missile and it has a range of 3,700 meters. It is very accurate since it must engage a point target. It has no indirect fire capability.

Of course, it penetrates armor, quite a bit of armor up to almost ——— of rolled homogenous armor. We have other systems that we are acquiring that are not in procurement if you would like me to cover those or provide it for the record.

Mr. **Miller**. If you would cover those for the record, I think that would be advisable.

[The information follows:]

We have four missile systems which we are procuring which are far enough along in the development cycle to permit us to discuss their capabilities. The first two are anti-armor weapons, namely the Advanced Anti-Armor Weapon System—Medium (AAWS-M) and the Advanced Anti-Armor Weapons System—Heavy (AAWS-H). AAWS-M will replace DRAGON as the Army's medium man-portable anti-armor weapon and will have a range of at least ———. Its "design-to" weight is required to be 45 pounds or less and we intend to procure ———. The AAWS-H will be a heavy anti-armor weapon capable of being mounted on several platforms. It will replace TOW and has a "design-to" range of ———. Neither of these weapons is far enough along in its development cycle to permit prediction of the missiles' maximum velocity. The next missile system under development is the Army Tactical Missile System or ATACMS which is an artillery weapon. ATACMS is a conventional ballistic missile system designed to attack targets beyond the capabilities of cannons or rockets. The maximum range of ATACMS will be between ———. The weapon will be a solid propellant missile with an inertial guidance system. Again no maximum speed for this system can be provided at this time. The final system for which data can be provided is the Non-Line-of-Sight air defense system or NLOS. The NLOS is a forward area air defense system designed to engage slow moving helicopters which are standing off beyond the range of line-of-sight weapons or masked by terrain from the view of other forward area weapons. The NLOS has a "design-to" range of ———.

### MISSILE PROPELLANT

Mr. Miller. There are two things I am wondering about. One is the speed of the missile.

General Cianciolo. Yes, sir.

Mr. Miller. For each of those, could you provide for the record the speed of each of the missiles that you did not already give? And secondly, are they all solid propellant missiles?

General Cianciolo. Yes, sir.

Mr. Miller. And how is the speed of the missile controlled if it is all the same type of solid propellant energy? They do travel at both supersonic and subsonic speeds, and there has to be some method of controlling that speed.

General Cianciolo. The speed is controlled by the rate at which the propellant is burned and you are right, some are supersonic and some are not supersonic, but none of these missiles that I have just described to you can the operator adjust the speed of the missile. Once he fires it, it goes at the speed for which it was designed to fly.

Mr. Miller. Are we reaching the stage where, although we have tanks and aircraft and other weapons and vehicles, nevertheless if we had a war in Europe, with so many missiles it would be a matter of hours or days rather than a prolonged war, because we have such accuracy in the missiles that we are doing to destroy everything that they can throw at us pretty quickly? Or they are going to destroy what we have in the way of tanks, they are going to destroy it as fast as we move the tanks in, within hours, within days? That is what I see from the missile picture, and I would appreciate if you can elaborate on that some.

General Cianciolo. We will, sir. The precision guided munitions have in fact changed the way we look at the battlefield and in our analytical efforts, we continue to study the impact of precision-guided munitions on our ammunition stock and how many precision-guided munitions do we procure, how many munitions do we procure that are not precision-guided? It is a very complex issue; we studied that constantly to ensure that our procurement requests are balanced against our operational needs and of course resources available.

Mr. Miller. Mr. Chairman, I can pursue this with people later. I appreciate the time and it has been enlightening.

I thank you, General.

### Aquila Remotely Piloted Vehicle

Mr. Young. It is nice to see you again, and I hope to be in a position to work with the Army on your problem areas this year as I have in the past.

I come to you in this set of hearings with a problem of my own. I would like to ask you about it.

When I get a few days off, when the Congress is not in session, I try to visit some of the defense industries to see first hand some of the things that they are doing, and having worked in the Intelligence Committee for six years and on this committee for some time. I have had access to practically everything there is in the classified world. On a recent visit to a plant in Wichita, Kansas, dealing with remotely-piloted vehicles, I asked some questions that would get into a classified area on several programs that come under the code name of PAVE. PAVE Tiger, PAVE Panther and PAVE something else.

I was subsequently told that I could not have those answers. I inquired as to why I couldn't have those answers. I was told because Army liaison has instructed the company and their security people not to give me access to those answers.

I would like to know who made the decision to deny me that type of information, and I would like to know why.

General THOMAS. Sir, I certainly cannot answer your question. There must be some misunderstanding on their part.

As you know, the PAVE series of remotely piloted vehicles are an Air Force system for the Air Force and I have no earthly idea why that would have occurred, but I will certainly pursue it and we will work with you and the Air Force to get whatever answers you need.

Mr. YOUNG. I appreciate that, but the advice I was given was that it was the Army who made this decision, and I understand that the Army is involved in one of the vehicles.

General THOMAS. I will pursue that and we will get back to you. I do not know.

[CLERK'S NOTE.—This matter was handled by General Thomas in a manner acceptable to Mr. Young.]

### FAMILY OF REMOTELY PILOTED VEHICLES

Mr. YOUNG. I would like to ask about Aquila which is not the program that is in question here, but the budget this year includes $117.7 million for the second year of procurement funding for Aquila Remotely Piloted Vehicle. Last year in frustration over cost growth, program slippage, technical problems and overspecification, authorization action reduced Aquila procurement from $134.6 million to $66 million.

The Armed Services Committee also asked the Army to consider a family of remotely piloted vehicles and report back to Congress. The report was received by the Committee on February 6, 1986.

Describe the Army's current family of remotely piloted vehicles programs.

General THOMAS. Yes, sir. I would be happy to.

I think one of the key points is that in the past, we have been a one-vehicle family now our position is that we ascribe to a family that has brothers and sisters with it.

The family UAV concept and the plan that we are pursuing includes three activities right now.

One is a corps level Intelligence Electronic Warfare (IEW) unmanned aerial (UAV). As directed by the committee last year to spend minimum of $3 million for NDI, we are using $11.6 million of the Aquila procurement money from fiscal year 1986 to accomplish a NDI procurement this fiscal year. We expect that an RFP will be on the street by the middle of April with a demonstration and flyoff for that which will be a near-term corps IEW three battery system is our intent.

In addition, we have the Aquila program which, as you know, is the corps artillery laser designating capability, which is the second member of the family, and a third member of the family right now that we are participating with, the Navy, the Marine Corps and DARPA, is the Amber project.

We are pursuing all three of those. In the family concept, we are starting with more of an overarching corps picture since that is the centerpiece of air-land battle with those particular platforms and as industry matures with their NDI candidates and as we mature our concepts of the UAV, we will then be pursuing the smaller versions to provide for the divisional capability such as over the hill.

But that would be commencing probably in 1988, 1988 or 1989, and we are pursuing that course.

Mr. YOUNG. Would you tell us a little bit more about Amber?

General THOMAS. Sir, Amber is a Navy-led program with DARPA, and it is one of those programs we talk about in the HPSCI. ——— . It is in development.

We have some birds now that they are flying and testing. I am not sure exactly where I cross the line on that one.

Mr. YOUNG. I think that is close enough. Obviously you prefer to pursue that in a different audience.

General THOMAS. We can pursue it in a different audience, yes, sir. I am not sure where I cross that line.

Mr. YOUNG. That is no problem. When I worked upstairs on the House Permanent Select Committee on Intelligence and also down here, I had a rude awakening one day. I thought that once we decided what we were going to do upstairs and got the authorizations that it was all over. Suddenly I found it didn't mean a thing without the money from this committee.

So sometimes the lines do cross. As the chairman indicated, if you don't know much about it, you will have a hard time funding it. We wanted to get an idea of what it was.

### AQUILA MISSIONS

The Army had previously intended that Aquila would carry a wide variety of payloads to serve numerous mission needs. What missions are now to be served by Aquila, and what missions will be served by other RPV's?

General THOMAS. Originally the Aquila program included nearly $300 million in RDT&E in 1978 and out years to grow the program both in endurance and in payload packages. That would then see the Aquila growing in endurance into a corps IEW kind of bird and to do such things as SIGINT, ELINT, IMINT, those kinds of things on the broad perspective from the division level up to the corps level ranging from 30 kilometers to couple hundred kilometers.

In restructuring the program, we have taken that money out. We have pledged to complete the RDT&E at a cost of no more than $273 million, limited to a TADARS mission and limited to its range and payload capacity and the difference is offset by the corps IEW family concept.

Mr. YOUNG. Will all the services use Aquila for surveillance on laser designation missions?

General THOMAS. Sir, right now there are no formal arrangements for other services to do that. However, when and if we get into procurement on that, it has been historically shown that other services, particularly the Marine Corps, come along if it meets their needs.

Mr. YOUNG. Are any of the other services pursuing their own version of Aquila or their own vehicle for these missions?

General THOMAS. To my knowledge, there is no other service pursuing a laser designating RPV.

Mr. YOUNG. What is the relationship of the Army's RPV family to the RPV programs of the Air Force, Navy and Marines?

General THOMAS. Sir, we have a jointness which I think is very healthy.

General Low is the Air Force officer in charge of that. Admiral Arthur is in charge in the Navy.

We, besides being a part of the Amber program which has a joint nature to that, we are signing a MOU with the Navy which is a joint MOU for all UAV's that we are collectively involved in. They are placing a deputy project manager in our project management office which we moved to MICOM and we are putting a deputy project manager in their project creating office and we are also a joint oversight group which will review the acquisition plans, strategies of each.

We are dividing up the nature of the RPV business. We will be responsible for the ground control stations, they will be responsible for a piece so that we do not duplicate those type things.

In addition to that, the Navy has a MOU with the Air Force for an extended range area and the JCS has directed the JRMB to conduct the analysis for a common data link and common mission payloads, and that is ongoing under the auspices of the Joint Resource Management Board which has the four Vice Chiefs of Staff on it.

### AQUILA PROCUREMENT PLAN

Mr. YOUNG. About three years ago, you reduced the number of Aquila vehicles from 995 to 548 because of changes in the operation concept and because of affordability. As of last year, the plan was to procure 13 battery sets consisting of 543 vehicles and 77 ground stations.

What changes have been made to the Aquila procurement plan?

General THOMAS. As this budget shows, sir, there is a tremendous reduction in the President's 1987 FYDP. That resulted from the budget being put together at the time there was considerable uncertainty in the Aquila program. We had a Red Team go in and look at the systems technical performance in DT and the system had problems. The DT was stopped. We had major concerns of whether to continue and during that process of stopping and evaluating, Lockheed paid out of their pocket to test and demonstrate the Aquila. That demonstration was not completed until February after the President's budget had been submitted.

That test was very successful, and in fact at the end of the test, there were Copperheads fired. With Aquila laser designating we had four moving Copperhead direct hits on tanks, also four stationary hits on tanks, and one Copperhead malfunction. So it proved out that the system works and satisfied our major concerns on that.

The budget was submitted at a time of uncertainty and is low as far as the total plan, the fiscal year 1987–88 portion of the procurement budget, though, is the same no matter what the long-term procurement quantities.

In context with the family, we are now developing what the total program will consist of in concert with the corps IEW NDI procurement.

Mr. YOUNG. What is the plan now for your total buy, the total number of vehicles?

General THOMAS. The current plan, sir, is although that is not reflected in the budget, or the FYDP submission, the current Army plan is to procure nine batteries of 376 air vehicles and 53 ground control stations, although this plan could be subject to modifications as the family concept matures.

As we determine the corps IEW NDI mix and capability, that may be traded off to some lesser number and we are also looking at not equipping every vehicle with a laser designator or every vehicle with a full-up AJ.

### AQUILA TESTING

Mr. YOUNG. Why did the Army stop the development test II last August?

General THOMAS. Sir, the development test II was stopped because there were five basic areas that were giving us problems and one very serious area and that is we could not automatically recover the vehicle into the net. It had to be driven into the net by the operator, and that is not very good.

Also, the designation was not mature, the detection and wide field of view was not mature and it had some problems with respect to a left-turn software algorithm. We had a team of people from the majority of our labs looking at this since it was an integration problem as well, and they recommended that we stop it.

We took that action. Then Lockheed put their blue team headed by Dr. Walt LeBerge on that and agreed that what we had seen was in fact true and that is the reason we stopped it.

Mr. YOUNG. Provide for the record if you would some detailed information on the specific findings of the red team and the blue team, the Lockheed blue team as they made their assessments.

[The information follows:]

The Army Red Team concluded that Aquila program had not demonstrated sufficient maturity nor a tested robustness of ability to accomplish a successful operational test (as it was then configured or would be configured for operational testing. The team identified four areas to have sufficient, risk as to be labelled "show stoppers". These were: tactical air vehicle recovery; system reliability; survey update; target detection, location and tracking procedures and training.

In addition to the "show stoppers", the Red Team identified system performance issues which it labelled critical uncertainties. First, it had not been proven that implementation problems and shortfalls would not occur in the modes of target detection, tracking and designation. Second, the susceptibility of the system to electromagnetic interference electromagnetic compatibility (EMI/EMC) had not been demonstrated. Third, proposed shortcuts in software verification could have resulted in performance problems. Fourth, there were uncertainties in silent running and dead reckoning because of recent changes. Fifth, sight stabilization was uncertain and automatic test equipment and built-in test equipment were not proven to be supportable.

The Lockheed Blue Team essentially agreed with the Red Team findings. They identified air vehicle recovery; detection, recognition and identification performance, and a need to understand the extent of Aquila's current capability as issues requiring resolution. Additionally, they stated that limited system assets required continued management and alternatives to flight testing, that hardware maturity must be demonstrated before DT OT, and that EMI testing must be completed. They also stated that Lockheed should invest in additional simulation capabiilties and conduct sensitivity studies using them.

Mr. YOUNG. I have a number of other questions on Aquila. I would like to submit them to you in writing in the interest of time.

[CLERK'S NOTE.—Questions submitted by Mr. Young and the answers thereto follow:]

QUESTION. In 1984, Operational Testing II was scheduled to be completed in July 1985 with a production decision in December 1985. Last year we were told that Development Testing II would be done in August 1985, Operational Testing would be done in December 1985, and a production decision made in March 1986. What are the current milestones, and why have they changed?

General THOMAS. Operational Testing II is scheduled to run from September through December 1986. The production decision will be made at a Defense Systems Acquisition Review Council (DSARC) level review in March 1987. The milestones have changed because, after development testing (DT) began, Lockheed was still having difficulty in resolving technical deficiencies that had been identified during contractors-preliminary qualification testing PQT-C). As a result, the Army formed an independent Red Team to assess the readiness of the RPV/MICNS system to complete operational and developmental testing and face a production decision. Based upon the Red Team's findings, the Army stopped further development testing until the contractor, at his own expense, had fixed the performance problems to the Army's satisfaction. Full scale engineering development (FSED) was extended by twelve months to accommodate this effort. A feature of the restructured program schedule is the inclusion of go no go decision points at which the Army can cancel the program if Aquila fails to meet scheduled objectives. The first of these decision points occurred in January following Lockheed's successful demonstration of their fixes.

QUESTION. Why did DT II testing even begin when the major technical deficiencies existed?

General THOMAS. The Aquila Government Test Review was conducted 23-24 April 1985 with the appropriate Army community in attendance. Technical deficiencies were presented as "Concerns" and "Lack of Design Maturity". Lockheed presented a detailed plan to resolve these deficiencies on a non-interference basis (weekend testing) during the early stages of DT II. The community agreed to begin DT II testing with performance evaluations that would permit Lockheed to resolve the deficiencies. After we entered DT II and our Red Team of technical experts reviewed the contractors actions in detail; however, it became clear that Lockheed would be unable to resolve these deficencies during the test.

QUESTION. Under Secretary Ambrose stated last December that, "The Army will cancel Lockheed Aquila contract if criteria are not met at any decision point." What criteria were established for the Lockheed demonstration phase which was just completed, and which ones were met?

General THOMAS. That demonstration was conducted to show that Lockheed had corrected technical problems that had been identified by the Army's Red Team last July. Pass/fail criteria were established in each of the following areas: laser designation; detection, recognition and identification of targets in wide field of view; moving target acquisition and tracking; automatic air vehicle recovery; survey update; and training procedures. During the demonstration, the contractor was able to achieve the following results:

60 laser designations on stationary targets (100%).
31 laser designations on moving targets (100%).
15 flights with handoff between different ground control stations.
Simultaneous control of two air vehicles.
Dead reckoning and survey update.
Consistent automatic recovery of the air vehicles.

In the area of detection, recognition and identification, the system attained ——— meter requirement for detection of off road targets in the wide field of view; however, in the narrow field of view, this requirement was exceeded. Therefore, performance of off-road detection was considered satisfactory. All other detection recognition and identification criteria were met. Criteria for laser designation, air vehicle recovery, tracking and moving target acquisition and central launch, recovery and handoff were met or exceeded. Survey update accuracy was judged to be acceptable and training procedures were assessed to be adequate for continuation into DT. The highlight of the demonstration, however, was a Copperhead live fire exercise. Nine targets were engaged with eight target hits—four against stationary targets and four against moving targets. The one miss was due to a munition failure. The PM and the Army's Red Team recommended continuing with development testing and the Army leadership concluded that Lockheed had shown sufficient progress to warrant continuing the program. As a result, development testing was resumed on February 27.

QUESTION. What specific criteria have been established for DT II and OT II?

General THOMAS. The System will be evaluated in DT II against specification and contract requirements in the following areas:

1. Reliability
2. Air Vehicle Recovery
3. Training Procedures
4. Survey Update
5. Detection, Recognition, and Identification
6. Target Tracking and Acquisition
7. Laser Ranging
8. Laser Designation
9. Software
10. Electromagnetic Interference/Compatibility
11. Built-in-test
12. Air Vehicle Handoff
13. Dual Air Vehicle Flights
14. Artillery Adjustment

15. Visual, Aural, Infrared, and Radar Detectibility
16. Laser Code Compatibility
17. Loss of Link (Reacquisition)
18. Dead Reckoning
19. Anti-Jam Immunity
20. Logistics
21. Tempest

The issues for OT II are:

1. Can the RPV System conduct successful flight operations in an operational environment?
2. Can the RPV System perform its target acquisition mission in an operational environment?
3. Can the RPV conduct indirect fire support for conventional field artillery systems (including Copperhead)?

The pass/fail criteria for development testing are shown in the attached briefing charts.

## RELIABILITY

- DT OBJECTIVE
  - ACCUMULATE RELIABILITY DATA TO DETERMINE AND ASSESS THE RELIABIITY CHARACTERISTIC OF THE TEST ITEM

- TEST CONDITIONS
  - RELIABILITY DATA WILL BE COLLECTED BY THE CONTRACTOR UTILIZING AN ADAPTED RAM/LOG TYPE DATA COLLECTION SYSTEM
  - CONTINUOUS EVALUATION -

| | |
|---|---|
| TADAR | .82 |
| FLIGHT | .91 |
| LS | .99 |
| GCS | .92 |

  - WHENEVER THERE IS A TIME LINE REQUIREMENT THAT IS INTERRUPTED BY THE TEST DIRECTOR FOR TEST PECULIAR REASONS, THE CLOCK FOR THAT TIME LINE WILL BE STOPPED FOR THE TEST PECULIAR FRAME

- PASS CRITERIA
  - RELIABILITY WILL BE EVALUATED BASED UPON RELIABILITY GROWTH ASSESSMENT OF WHETHER THE REQUIREMENTS WILL BE MET IN ACCORDANCE WITH THE PLANNED RELIABILITY GROWTH

## AIR VEHICLE RECOVERY

- o DT OBJECTIVE
  - TO EVALUATE THE RECOVERY SUBSYSTEM PERFORMANCE

- o TEST CONDITIONS
  - AV RECOVERY GUIDANCE AID (RGT) SHALL BE USED IN ALL DT FLIGHTS
  - ALL AVAILABLE RECOVERY STATIONS (RCs) USED IN RECOVERY
  - SITE AND SYSTEM SET-UP TO PROVIDE WIND AND SUN ANGLE ENCOMPASSING OPERATING ENVELOPE (AS AVAILABLE)

- o PASS CRITERIA
  - NUMBER OF SUCCESSFUL RECOVERIES SHOULD PROVIDE A .9 PROBABILITY OF SUCCESS WITH A CONFIDENCE OF .8
  - SUCCESSFUL RECOVERY IS ONE WHERE:
    - AV TURNAROUND ≤ 1 HOUR MAINTENANCE TIME AND WITHOUT MAJOR DAMAGE (I.E., PAYLOAD OR ADT DAMAGE REQUIRING REPLACMENT OR AIR VEHICLE IMPACT WITH RECOVERY SYSTEM STRUCTURAL MEMBERS)
    - RECOVERY TIME ≤ 10 MINUTES

MISSION PAYLOAD OPERATOR (MPO) TRAINING PROCEDURES

- DT OBJECTIVE
  - ASSESS THE ADEQUACY OF THE MPO PROCEDURES (-10's)

- TEST CONDITIONS
  - USE ALL FLIGHTS TO UTILIZE/REVISE PROCEDURES (-10's)
  - NO SPECIFIC ADDITIONAL FLIGHTS

- PASS CRITERIA
  - MPO PROCEDURES REVISED AS REQUIRED

## SURVEY UPDATE

- o DT OBJECTIVE
  - TO DETERMINE THE ABILITY OF RPV SYSTEM TO CONDUCT SURVEY UPDATE (SU) FOR THE FORWARD CONTROL STATION (FCS)

- o TEST CONDITIONS
  - 20 SU TRIALS (INCLUDING 3 IN LAD DEMO)
  - 3 MPSs, 3 AVs

- o GOAL
  - 20 TRIALS TO MEET FOLLOWING TARGET LOCATION CIRCULAR ERROR PROBABLES (CEPs)

| RANGE | ALLOWABLE CEP (METERS) |
|---|---|
| 25 KM | (Deleted) |
| 45 KM | (Deleted) |

27.4

## DETECTION, RECOGNITION, IDENTIFICATION

- DT OBJECTIVE
  - DETERMINE CAPABILITY OF DETECTION, RECOGNITION, IDENTIFICATION (DRI) AT THE FOLLOWING SPECIFICATIONS

| | | MINIMUM RANGE | |
|---|---|---|---|
| DRI CATEGORY | FOV | OFF-ROAD | ON-ROAD |
| DETECTION | 7.2° | (Deleted) | (Deleted) |
| RECOGNITION | 2.7° | (Deleted) | (Deleted) |
| IDENTIFICATION | 2.7° | (Deleted) | (Deleted) |

- TEST CONDITIONS
  - 60 TRIALS FOR EACH CATEGORY
  - 3 DIFFERENT MISSION PAYLOAD OPERATORS (MPOs) AND AIR VEHICLE (AV)/MISSION PAYLOAD SYSTEM (MPS) COMBINATIONS
  - CUED/UNCUED, SINGLE/MULTIPLE, STATIONARY/MOVING, LONG SHADOW/SHORT SHADOW, TARGET COMBINATIONS
  - TEST AT 500M, 1000M, AND 1500M ALTITUDE

- PASS CRITERIA
  - PERFORM WITH 50% PROBABILITY AND 80% CONFIDENCE

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## TARGET ACQUISITION AND TRACKING

- DT OBJECTIVE
  - DETERMINE THE ABILITY TO PERFORM TARGET ACQUISITION AND TRACKING
- TEST CONDITIONS
  - MINIMUM 40 TRIALS CONSISTING OF ONE ACQUISITION AND A CONTIGUOUS 3 MINUTE TRACKING OPPORTUNITY
  - MILITARY VEHICLE MOVING AT A VELOCITY OF UP TO 25 KM/HOUR
  - ALTITUDES OF 500M, 1000M, 1500M
  - RACETRACK, CIRCLE, AND FIGURE 8 LOITER PATTERNS USED
- PASS CRITERIA
  - 90% OF ALL TRIALS SUCCESSFULLY* TRACKED FOR 3 MINUTES

*SUCCESSFUL TRACK IS DEFINED AS MAINTAINING THE TRACK BOX ON THE TARGET 95% OF THE TIME

TRACKING STARTS WHEN THE TARGET ENTERS THE TRACK BOX (PROVIDED 5 SUBSEQUENT SECONDS OF GOOD TRACK OCCURS)

## LASER RANGING

- o DT OBJECTIVE
  - DETERMINE THE ABILITY OF THE RPV LASER RANGE FINDER TO PERFORM RANGING OUT TO A DISTANCE OF (deleted) WITH AN ACCURACY OF (deleted)
- o TEST CONDITIONS
  - 20 TRIALS FROM (deleted)
- o PASS CRITERIA
  - PERFORM WITH A PROBABILITY OF .80 WITH AN 80% CONFIDENCE LEVEL

## DESIGNATION

- o DT OBJECTIVE
  - DETERMINE THE RPV SYSTEM CAPABILITY TO DESIGNATE TARGETS FOR PRECISION GUIDED MUNITIONS

- o TEST CONDITIONS
  - 5 FLIGHTS/12 TRIALS PER FLIGHT
  - 3 AV/MPS ITEMS
  - 120 SECONDS CONTINUOUS DESIGNATION PER TRIAL

- o PASS CRITERIA
  - 90% SUCCESSFUL* TRIALS

*SUCCESSFUL TRIAL IS DEFINED AS (deleted)

NOTE: DATA DURING LAD DEMO EXCEEDED REQUIREMENT

# SOFTWARE

- o DT OBJECTIVE
  - DETERMINE WHETHER THE SOFTWARE IS SUFFICIENTLY MATURE FOR FIELDING

- o TEST CONDITIONS
  - CONTINUOUS EVALUATION THROUGHOUT DT II
  - NO SOFTWARE CHANGES DURING DT II WITHOUT RE-TEST OF THOSE EVENTS AFFECTED BY CHANGE

- o PASS CRITERIA
  - NO PRIORITY 1 AND 2 SOFTWARE ERRORS
  - PRIORITY 1 ERROR - PREVENTS ACCOMPLISHMENT OF AN OPERATIONAL OR MISSION ESSENTIAL FUNCTION OR JEOPARDIZES PERSONAL SAFETY
  - PRIORITY 2 ERROR - ADVERSELY AFFECTS ACCOMPLISHMENT OF AN OPERATIONAL OR MISSION ESSENTIAL FUNCTION SO AS TO DEGRADE PERFORMANCE AND FOR WHICH NO ALTERNATIVE WORK-AROUND SOLUTION EXISTS

27.9

## EMI/EMC

- o DT OBJECTIVE
  - TO DETERMINE SYSTEM CAPABILITY TO MEET EMI REQUIREMENTS OF MIL-STD-461 AND EMC REQUIREMENTS OF MIL-E-6051
- o TEST CONDITIONS
  - ONE FULL SYSTEM LEVEL TEST (AT MICOM)
  - 3 FUNCTIONAL TEST MODES (PRE-LAUNCH/SIM FLT/RECOVERY)
  - MIL-E-6051 MICOM ENVIRONMENT
  - SYSTEM ELEMENTS INCLUDE AV, LS, GCS, RGT, AND RV
- o PASS CRITERIA
  - NO MISSIONS CRITICAL DEFICIENCIES (AS DEFINED IN TEST PLAN)

## BITE/ATE

- DT OBJECTIVE
  - DETERMINE THE ADEQUACY OF BITE/ATE

- TEST CONDITIONS
  - CONTINUOUS EVALUATION THROUGHOUT DT - INFORMATION ONLY/NOT SCORED
  - FAULT ISOLATION DEMO (POST DT)

- PASS CRITERIA
  - MINIMUM OF 90% FAULT ISOLATION AT ORGANIZATION LEVEL IN FAULT ISOLATION DEMO

## CENTRAL LAUNCH, RECOVERY, AND HANDOFF

- o DT OBJECTIVE
    - IDENTIFY ABILITY OF RPV SYSTEM TO CONDUCT MISSION AFTER HANDOFF
- o TEST CONDITIONS
    - 50 HANDOFFS CURRENTLY PLANNED
    - 6 DUAL AIR VEHICLE MISSIONS
    - BOTH REMOTE GROUND TERMINALS (RGTs) MAINTAIN LINE OF SIGHT (LOS) TO AV DURING HANDOFF
- o PASS CRITERIA
    - 90% PROBABILITY OF SUCCESS WITH 90% CONFIDENCE
    - SUCCESS IS DEFINED AS: HANDOFF SHOULD BE ACCOMPLISHED IN ≤ 7.5 MINUTES WHERE HANDOFF COMPLETION OCCURS WHEN BOTH LINKS ARE ESTABLISHED AND THE GROUND CONTROL STATION (GCS) INDICATOR LIGHT COMES ON

## ARTILLERY ADJUSTMENT

- DT OBJECTIVE
  - DETERMINE THE RPV SYSTEM'S CAPABILITY TO PROVIDE TARGET LOCATION INFORMATION FOR THE ADJUSTMENT OF ARTILLERY

- TEST CONDITIONS
  - 3 RPV FLIGHTS, MINIMUM/2 TARGETS PER FLIGHT
  - 4 SIMULATED ART'L BURST PER TARGET
  - 3 ALTITUDES: 500M, 1000M, 1500M, ABOVE GROUND LEVEL WITH SLANT RANGE ≥ (deleted)
  - FLIGHT LOITER PATTERN DEVIATIONS WILL NOT BE SCORED (DUE TO ROLL INHIBIT)
  - ON AND OFF ROAD TARGETS WITH LONG AND SHORT SHADOW ANGLES
  - DIFFERENT AV/MPS COMBINATION FOR EACH FLIGHT
  - 500M ALTITUDE TRIALS WILL BE PERFORMED WITH RGT TO AV LINE OF SIGHT MAINTAINED

- PASS CRITERIA
  - 90% OF CORRECTIONS ATTEMPTED
  - 100M CEP FOR TARGETS < (del.) FROM RGT
  - LINEAR INCREASE IN CEP TO 200M FOR TARGETS OUT TO (del.) FROM RGT
  - LIVE ARTILLERY FIRE WILL NOT BE SCORED

## TARGET LOCATION ACCURACY

o DT OBJECTIVE
  - DETERMINE THE RPV SYSTEM'S CAPABILITY TO PROVIDE TARGET LOCATION INFORMATION

o TEST CONDITIONS
  - 48 TRIALS
  - 500M, 1000M, AND 1500M ALTITUDES

o PASS CRITERIA
  - SYSTEM SHALL MEET THE FOLLOWING (CEPs)

| RANGE | ALLOWABLE CEP (METERS) |
|---|---|
| 25 KM | (deleted) |
| 45 KM | (deleted) |

## DETECTIBILITY/VISUAL

o DT OBJECTIVE
  - DETERMINE THE AV's VISUAL SIGNATURE

o TEST CONDITIONS
  - DELETED ALTITUDE
  - FRONT, SIDE, AND REAR ILLUMINATION FROM SUN
  - VISIBILITY AND LIGHT HAZE AS AVAILABLE
  - PERFORMED WITH AV PAINTED FINAL TACTICAL COLOR

o PASS CRITERIA
  - DELETED MAXIMUM PROBABILITY OF VISUAL DETECTION AT DELETED ALTITUDE AND SLANT RANGE

## DETECTIBILITY/VISUAL AND AURAL
## UNSCORED

- DT OBJECTIVE
  - DETERMINE THE AV'S VISUAL AND AURAL SIGNATURE FOR COMPARISON WITH SKYEYE
- TEST CONDITIONS
  - AS SIMILAR TO SKYEYE TEST CONDITIONS AS POSSIBLE AT FT. HUACHUCA
  - NO VISUAL TRIALS WILL BE PERFORMED AT 500m (SCORED VISUAL DETECTION FLIGHTS WILL BE SUBSTITUTED)
- PASS CRITERIA
  - NONE - FOR COMPARISON PURPOSES ONLY
  - TEST SITE ALTITUDE DIFFERENCES WILL BE ADJUSTED/EVALUATED

## DETECTIBILITY/INFRARED (IR) (GROUND TEST)

- DT OBJECTIVE
  - DETERMINE THE IN-FLIGHT IR SIGNATURE OF THE RPV

- TEST CONDITIONS
  - STAND MOUNTED AV

- PASS CRITERIA
  - IR CRITERIA LESS THAN REQUIRED BY SAM SYSTEMS

NOTE: DT TEST OBJECTIVE SATISFIED (OMEW TEST REPORT)

## DETECTIBILITY/IR (IN-FLIGHT)

- DT OBJECTIVE
  - DETERMINES THE IN-FLIGHT IR SIGNATURE OF THE RPV

- TEST CONDITIONS
  - RPV IN FLIGHT, 50' AGL, 200' GROUND DISTANCE
  - 5 MEASUREMENTS AT EACH ASPECT ANGLE, HEAD ON, 45o, SIDE
  - RADIOMETER MEASUREMENT "WINDOW" TO INCLUDE HORIZON

- PASS CRITERIA
  - IR ENERGY LESS THAN REQUIRED BY *

NOTE: DT TEST OBJECTIVE SATISFIED (NWC DRAFT REPORT TO AVSCOM - APR 85)

## DETECTIBILITY/RADAR*

- o DT OBJECTIVE
  - TO DETERMINE THE AV'S RADAR CROSS SECTION (RCS)
- o TEST CONDITIONS
  - ENGINEERING TEST AT HOLLOMAN AFB
- o PASS CRITERIA
  - RCS ≤ DELETED

NOTE: DT TEST OBJECTIVE HAS BEEN SATISFIED

*NOTE: DT TEST OBJECTIVE HAS BEEN SATISFIED

# LASER

- o DT OBJECTIVE
  - DETERMINE RPV SYSTEM'S CAPABILITY TO DESIGNATE TARGETS FOR PRECISION GUIDED MUNITIONS (COPPERHEAD, HELLFIRE AND LASER GUIDED BOMB SYSTEMS)

- o TEST CONDITIONS
  - 8 COPPERHEAD FLIGHTS
  - 3 TO 5 HELLFIRE FLIGHTS
  - MIX OF 3 LASER PULSE CODES
  - STATIONARY AND MOVING TARGETS
  - LABORATORY PULSE TRAIN ANALYSIS IS PERFORMED BY LAD

- o PASS CRITERIA
  - MEETS COPPERHEAD $P_H$

    NOTE: 8 GOOD COPPERHEAD FLTS (ONE LASER PULSE CODE) COMPLETED
  - LABORATORY PULSE ANALYSIS MEETS SPEC

## LOST LINK

- o DT OBJECTIVE
  - TO ASSESS THE CAPABILITY OF THE GCS TO REACQUIRE THE AV AFTER A LOSS OF LINK
- o TEST CONDITIONS
  - NO PLANNED TESTS
  - COLLECT AND ANALYZE DATA ON INADVERTENT LOST LINKS
- o PASS CRITERIA
  - ASSESSED AS PART OF FLIGHT RELIABILITY

## DEAD RECKONING

- DT OBJECTIVE
  - TO DETERMINE IF THE AIR VEHICLE CAN NAVIGATE WITH THE ACCURACY NEEDED TO REACQUIRE AFTER DEAD RECKONING

- TEST CONDITIONS
  - 20 DEAD RECKONING FLIGHT PERIODS (10 AV AND 10 MANNED AIRCRAFT)
  - 3 AVs WITH 3 DIFFERENT ATTITUDE REFERENCE ASSEMBLIES (ARAs)
  - DEAD RECKONING SEGMENTS (MAXIMUM 20 MINUTES) TO INCLUDE A MAXIMUM OF 15 WAYPOINTS

- PASS CRITERIA
  - ASSESSED AS PART OF FLIGHT RELIABILITY

## ANTI-JAM

- o DT OBJECTIVE
  - DETERMINE ANTI-JAM CAPABILITY OF MICNS
- o TEST CONDITIONS
  - ENGR. TEST PERFORMED BY HARRIS
  - THREAT DELETED JAMMERS
  - JAMMING POWER LEVEL DELETED DBM (GDT) DELETED DBM (ADT)
  - SIGNAL-JAMMER SEPARATION ± DELETED °
  - EMV DATA COLLECTION DURING DT - MODELING AND ANALYSIS TO FOLLOW
- o PASS CRITERIA
  - MINIMUM DATA RATE DELETED KB/S
  - BIT ERROR RATE (BER) PERFORMANCE DELETED (GDT) DELETED (ADT)
  - RANGE DELETED KM

# LOGISTIC SUPPORTABILITY

- DT OBJECTIVE
  - OBTAIN AND ANALYZE MAINTENANCE AND SUPPLY DATA ON THE TEST ITEMS
- TEST CONDITIONS
  - CONTINUOUS PROCESS THROUGHOUT DT
- PASS CRITERIA
  - DA STANDARD: DEMAND SATISFACTION - DEMAND ACCOMMODATION
  - EASE OF MAINTENANCE
  - ADEQUACY OF TMs

UNCLASSIFIED

# TEMPEST

- o DT OBJECTIVE
  - TO DETERMINE IF THE GCS UNINTENTIONALLY GENERATES COMPROMISING EMANATIONS RESULTING IN INTERCEPTION OF CLASSIFIED DATA
- o TEST CONDITIONS
  - ELECTRIC RADIATION
  - MAGNETIC RADIATION
  - BLACK LINE CONDUCTION
  - POWER LINE CONDUCTION
  - HIJACK
  - NONSTOP
- o PASS CRITERIA
  - DETECTED COMPROMISING EMANATIONS SHALL NOT EXCEED LIMITS PER NACSEM 5100 AND NACSEM 5112

**Question.** What are the milestones for development and testing of the forward looking infrared (FLIR) payload for Aquila?

General **Thomas.** The FLIR milestones are:

Developmental Testing/Operational Testing (DT/OT) II—Jul 88–Jan 89
Production Decision—Apr 89
1st Unit Equipped—Sep 91
Initial Operating Capability—Nov 91

**Question.** What other payloads are being developed for Aquila, and what are the associated milestones?

General **Thomas.** The only payloads currently being developed for Aquila are the laser designating and reconnaissance daylight and FLIR mission payloads.

**Question.** What product improvements are being considered for Aquila, and what is the associated cost of each?

General **Thomas.** There are no product improvements currently being considered for Aquila.

### AQUILA COST

**Question.** Through fiscal year 1985, $623 million has been spent for Aquila research and development. what will it cost to complete the day/night RDT&E program? Provide a complete breakout, by fiscal year, for the record.

General **Thomas.** we are unable to breakout the daylight mission payload system (MPS) from the cost of the basic Aquila because many of these costs are combined and difficult to isolate. The government costs for the RPV, less MICNS and FLIR, are:

| | |
|---|---|
| 1986 | $61.2 |
| 1987 | 52.4 |
| 1988 | 5.4 |
| 1989 | 11.6 |
| 1990 | 13.0 |
| 1991 | 7.3 |
| Cost to complete | 3.9 |

Lockheed is adding $36.2 million out of its pocket to the FY86 total and $5.1 to the FY87 total as part of the cost sharing agreement reached in 1985.

The cost of the FLIR development is:

| | |
|---|---|
| 1986 | $19.6 |
| 1987 | 40.7 |
| 1988 | 31.1 |
| 1989 | 9.3 |
| 1990 | 0 |
| 1991 | 0 |
| Cost to complete | 0 |

The government cost to complete the entire day/night RDTE program, with MICNS, is:

| | |
|---|---|
| 1986 | $86.2 |
| 1987 | 101.4 |
| 1988 | 40.0 |
| 1989 | 24.4 |
| 1990 | 13.0 |
| 1991 | 7.3 |
| Cost to complete | 3.9 |

**Question**. To what total dollar figure was Under Secretary Ambrose referring when he said last December that, "The Army will cancel the Aquila program rather than accept any further RDTE cost growth"?

General **Thomas**. Under Secretary Ambrose was referring to the restructured Aquila RDTE day/night system cost, FY 86 to completion of $276.3M.

**Question**. What other R&D costs are expected for Aquila?

General **Thomas**. No other R&D costs are expected for Aquila.

**Question**. Last year, the projected Aquila procurement cost was $1.175 billion for 13 battery sets, to include 543 air vehicles and 77 ground control stations. What is the current cost of the revised program of 9 batteries consisting of 376 air vehicles and 53 stations?

General **Thomas**. The procurement cost estimate for 9 batteries (376 air vehicles/53 ground stations) is $1.057 billion.

**Question**. What accounts for the Aquila procurement cost growth?

General **Thomas**. Total Aquila procurement costs have actually declined. The Army estimate for a 9 battery program is about $118.8M less than for the 13 battery program of last year; however this reduction in total unit costs has been partially offset by a rise in unit procurement costs. This increase is a result of several factors. The fact that there are fewer units over which to amortize costs is the primary factor. Other contributing factors are scheduling shifts, differences in manpower accounting procedures between MICOM and AVSCOM and revised procurement cost estimates for the FLIR and MICNS.

**Question**. Is there a cost beyond which Aquila is considering unaffordable?

General **Thomas**. The Army will not support any costs beyond the estimate of $276 million needed to complete RDTE or $1.057 billion for a 9 battery procurement program.

**Question**. How many battery sets are funded in the Army's fiscal year 1987 five year budget?

General **Thomas**. The fiscal year 1987 five year defense plan contains sufficient funding to procure four battery sets of 84 air vehicles and 24 ground control stations; however, the Army goal is still a 9 battery program. We are currently revisiting that issue in the structuring of the FY88-92 POM.

**Question**. Why are only 4 battery sets funded when the approved Army program is 9 battery sets?

General **Thomas**. The FY 87 President's budget was put together at a time of considerable uncertainty in the Aquila program and was not funded at the required level. As a result of outstanding technical performances issues reported by an Army instituted Red Team, DT II was stopped. The Army entered a period of intense program review in which the Army was close to terminating the program. During this period Lockheed paid out of its own pocket to fix identified performance problems and demonstrate that those fixes had solved the problem. That demonstration was not completed until after the President's budget had been submitted and confidence in the program restored. In addition, we were developing the Family of Unmanned Aerial Vehicles (UAV) and it was becoming clear that total Aquila requirements might change as a result of Aquila's integration into this family.

QUESTION. Is a four battery set program considered to be a viable, executable program?

General THOMAS. The four battery program is considered to be an executable program; however, the unit costs are such that there could be a question of affordability. As you may be aware, we have recently had to file a Nunn-McCurdy technical threshold breach because the program acquisition unit cost of Aquila rose under the four battery program. The Army goal is still a 9 battery program although we are revisiting that issue in the FY 88–92 POM in accordance with the developing plan for a Family of Unmanned Aerial Vehicles (UAV).

QUESTION. What would it cost to provide 9 batteries of the SKYEYE RPV, with which the Army already has cost and operational experience?

General THOMAS. The cost and operational experience we've developed on SKYEYE to date is not really adequate to provide you a valid estimate because the whole operation has been contractor operated and maintained. We believe that attempting to replace Aquila with SKYEYE would be a mistake. First, an off-the-shelf SKYEYE or other NDI RPV would not provide us the capability that Aquila will give us. Secondly, to upgrade SKYEYE or other RPV to Aquila's capability would require additional time and money. We did a study in 1984 comparing the cost of Aquila versus the cost of upgrading several off-the-shelf systems to perform Aquila's mission. None of the alternatives in that study were modified to possess all the features of Aquila I've just described. Even with that, the conclusion of that study was that, while the procurement costs for an off-the-shelf system were lower, the overall program costs were greater because of the additional development required to bring the alternative up to the required capability. This would also extend the fielding of this capability by at least a year.

QUESTION. Why not Skyeye or some other non-militarized alternative to Aquila?

General THOMAS. No non-militarized remotely piloted vehicle provides all the capabilities of Aquila. Aquila flight operations are automatic. This means that it does not require a fully trained pilot to fly and navigate the RPV. Aquila has a hardened, two-way data link that prevents the enemy from capturing your air vehicle, from using your transmissions for his own purposes or from jamming your use of the air vehicle. The Aquila is designed against military specifications for world wide deployability. The Aquila has an onboard laser range finder designator that enables it to designate for laser guided munitions well forward of the FLOT, cue Army and Air Force aircraft to targets and precisely locate targets for artillery fire. Our analysis indicates that when Skyeye or some other off-the-shelf RPV is modified to include these features, and the training and logistics packages are added, the costs approach that of Aquila. Furthermore, our analysis indicates that changing to an NDI alternative at this point would delay the fielding of Aquila's capability by at least a year and ultimately cost more in RDTE than the remaining RDTE cost for Aquila.

Question. What are the costs associated with the development and procurement of the other members of the RPV family? Provide a complete profile and breakout for the record and indicate which portions are not funded in the 1987 five year budget.

General THOMAS. The Army has currently defined two members for the family of UAVs: Aquila and Corps Intelligence Electronic Warfare (IEW) UAV. Additional systems will be added as requirements are validated and operational concepts approved.

Aquila funding follows:

AQUILA FY87 PRESIDENT'S BUDGET (PROCURES 4 BATTERY SETS)

| | FY 87 | FY 88 | To complete |
|---|---|---|---|
| RDTE | $100.1 | $19.4 | $13.2 |
| Procurement | 117.1 | 193.3 | 219.8 |
| UNFUNDED AQUILA REQUIREMENTS | | | |
| RDTE | 0 | [1]20.6 | [1]35.4 |
| Procurement | 0 | 0 | [2]504.3 |

[1] Adds funds to complete FLIR and Test Program Set (TPS) development not contained in FY87 President's Budget.

[2] Procures 5 additional battery sets and provides for war reserves and training attribiton.

FY 86 funding for the initial unit sets of Corps IEW UAV includes $3.9M RDTE and $21.5M procurement. Additional funding follows:

INTELLIGENCE AND ELECTRONIC WARFARE (IEW) UNMANNED AERIAL VEHICLE—FY 87 PRESIDENT'S BUDGET

| | FY 87 | FY88 | To complete |
|---|---|---|---|
| RDTE | 0 | $2.0 | $4.0 |
| OPA | 0 | [1]TBD | [1]TBD |

[1] Corps IEW UAV procurement funding for FY88-92 is being developed in the FY88-92 Five Year Defense Plan and will be available in May 86.

Funding for other members of the family of UAVs excluding Aquila follows:

JOINT AMBER TECHNOLOGY PROGRAM—FY 87 PRESIDENT'S BUDGET

| | FY 87 | Fy 88 | To complete |
|---|---|---|---|
| RDTE | $4.9 | $5.0 | 0 |
| Procurement | 0 | 0 | [1]TBD |

[1] Applications for AMBER technology will be determined as the technology matures.

## AQUILA—FISCAL YEAR 1986 AND 1987 BUDGETS

QUESTION. Provide for the record a complete breakout, justification and explanation of the fiscal year 1986 appropriation execution plan, including any reprogrammings.

General THOMAS. RPV appropriations for FY86 were $110.1 million with $66.0 million in procurement and $44.1 million in RDTE. The $44.1 million in RDTE consisted of $16.0 million in PE 63725 (RPV/Drones-Advanced Development), $23.1 million in PE 64730 (RPV-Engineering Development) and $5.0 million in PE 64705

(MICNS). The FY86 RDTE program requirements are broken out as follows:

| *Purpose* | *Millions* |
|---|---|
| Army share of DT/OT II and collective training in preparation for OT II (Lockheed pays 50 percent) | $16.0 |
| Fabrication and testing of FLIR mission payload. Test Program Set (TPS) Development for MICNS | 23.8 |
| New work (survivability testing, additional air vehicles for FLIR integration, new O&O, post DT/OT fixes, automatic test equipment) | 13.2 |
| Contract extension & in house support | 33.2 |
| FY86 RDTE requirement for RPV | 86.2 |

The following reprogramming actions have been requested to support FY86 Aquila RDTE requirements:

| From | To | Amount (millions) |
|---|---|---|
| PE 63725 (RPV Drones Adv Dev) | PE 64730 (RPV Eng Dev) | $14.8 |
| Aquila OPA 2 | PE 64730 (RPV Eng Dev) | 35.3 |

These reprogramming actions will bring the total funding available to meet FY86 Aquila RDTE requirements to $84.8 million. This total consist of the two reprogramming actions, the original $23.1 million in PE 64730 (RPV-Eng Dev), the $5.0 million in PE 64705 (MICNS) and a $6.6 million carryover from previous years. The remaining $1.2 million in PE 63725 will be used to support the joint Army/Navy/DARPA Amber program.

The procurement dollars are broken out as follows:

| | Millions |
|---|---|
| Purchase of non-developmental item (NDI) Corps Intelligence and Electronic Warfare (IEW) unmanned aerial vehicle (UAW) | $11.6 |
| Reprogrammed to support RPV (Aquila) RDTE | 35.3 |
| EOC spares | 8.8 |
| Pre-production proofing | 10.3 |
| Total | 66.0 |

Additional reprogrammings are underway in these lines to support the NDI IEW UAV procurement, and the joint Army/Navy Amber program. These are:

| From | To | For | Amount (millions) |
|---|---|---|---|
| Misc billpayers | PE 63725 (UAV) | Amber Program | [illegible] |
| Misc billpayers | PE 64730 | NDI IEW UAV | [illegible] |
| Misc billpayers | Aquila OPA 2 | NDI IEW UAV Procurement | [illegible] |

**Question**. Also provide a complete breakout and justification of the fiscal year 1987 procurement and research and development budget.

General **Thomas**. RPV RDTE funding requirements for FY87 are as follows:

| *Purpose* | *Millions* |
|---|---|
| Army share of OT II costs (Lockheed pays 50 percent) | $5.1 |
| Preparation and fielding of one Block II Early Operational Capability (EOC) system, completion of FLIR contractor tests and delivery of three systems to Lockheed for system integration and continuation of MICNS TPS | 45.1 |
| FLIR and MICNS program stretch | 14.5 |
| Continuation of new work started in FY86 | 19.8 |
| Aquila/Skyeye survivability test | 4.9 |
| In house support and contract extension | 12.0 |
| Total RDTE requirement (President's budget contain only $100.1M) | 101.4 |

The following is a breakdown of FY87 Aquila procurement costs ($M):

| *Purpose* | *Millions* |
|---|---|
| Item Hardware [1] | 31.1 |
| Engineering Change | 2.5 |
| Testing | 9.0 |
| Special Tooling | 38.3 |
| Documentation | 12.1 |
| Government Engineering | 14.2 |
| Contractor Engineering | 6.2 |
| Training Base Aids [2] | 4.3 |
| Total | 117.7 |

[1] 5 air vehicles, 4 missions payload packages, 2 ground control stations, 3 launch subsystems, 3 recovery subsystems, 5 MICNS air data terminals, 4 MICNS ground data terminals, 2 RPV maintenance shelters

[2] 3 RPV training simulators, 6 inert air vehicles

### FAMILY OF REMOTELY PILOTED VEHICLE

QUESTION. What is the relationship of the Army's "Family" to the RPV programs of the Air Force, Navy and Marine Corps?

General THOMAS. The Army's Family of Unmanned Aerial Vehicles (UAVs) has been established in coordination with the Air Force, Navy and Marine Corps. Using a Joint Requirements Management Board (JRMB) review of Service requirements and programs, the Army developed guidelines to ensure a common strategy for development and acquisition of UAVs which eliminates any duplicative efforts.

The Army's UAV requirements are predominantly short range. The Army coordinates/cooperates very closely with the Navy and Marine Corps which have requirements for short range UAVs. The Army primarily monitors the Air Force UAV efforts which are directed toward medium to long range UAVs.

The Army and Navy established a Memorandum of Agreement (MOA) for a Remotely Controlled Vehicle (RCV) Joint Program in June 1985. Both Services are working closely with the Defense Advanced Research Projects Agency to develop the Amber system technology. The Army and Navy are currently staffing a second MOA for an UAV Joint Program which addresses a common strategy for research, development and acquisition of short range UAVs. The family of UAVs excluding Aquila will fall within the scope of this MOA.

In summary, there is an excellent relationship with the Army's family of UAVs to programs of the Air Force, Navy and Marine Corps.

QUESTION. About three years ago the Army reduced the number of Aquila air vehicles to be procured from 995 to 548 because of changes in the operation concept and affordability. As of last year, the plan was to procure 13 battery sets, consisting of 543 air vehicles and 77 ground stations. What changes have been made to the Aquila procurement plan and why?

General THOMAS. Since we briefed you last year on our 13 battery Aquila program, we have continued to evaluate our requirements both in terms of affordability and the Army's new concept for a Family of Unmanned Aerial Vehicles (UAVs). The Army's current plan is to procure 9 batteries of 376 air vehicles and 53 ground control stations, although we are revisiting that issue in accordance with the developing plan for a family of Unmanned Aerial Vehicles. The FY 87 President's budget only supports a four battery program; however, FY 87 and FY 88 funding remains the same regardless of the final decision on total procurement quantities. Funding requirements beyond FY 88 will be adjusted in the FY 88-92 POM.

[CLERK'S NOTE.—End of questions submitted by Mr. Young.]

Mr. YOUNG. Thank you very much.

Thank you, Mr. Chairman.

### OTHER RPV PROGRAMS

Mr. CHAPPELL. General, I had a briefing not too long ago by one of the manufacturers, and I can't remember for sure—apparently it was a team, somebody was working with something called the PEANUT. What is that?

General THOMAS. Sir, the PEANUT is in development by Canadair, a CL-227. We have looked at that and are continuing to look at that as one of the potential UAVs for the smaller ones that I mentioned in the family concept.

There is another one that is available from the British called the SPRITE. These are not now programs we are funding. Our resources that I mentioned in the family concept are going to the corps IEW and the artillery laswer designating and the Amber project.

Mr. CHAPPELL. Wasn't the one that—Canadair, that is the PEANUT. How about SKYEYE?

General THOMAS. ———. We have some of those aircraft in Central America.

Mr. CHAPPELL. At the time they were showing the PEANUT—you say that was Canadair—was that sold by them? I thought they were teamed with somebody.

General THOMAS. I have seen two presentations, one strictly by Canadair which is the platform itself. Then I have seen another presentation by Canadair and Ford Aerospace which puts the FLIR package, the night vision package that we have in Aquila, they propose to put into the PEANUT.

Mr. CHAPPELL. Is the PEANUT propeller driven?

General THOMAS. Yes, a PEANUT with a helicopter-type blade.

Mr. CHAPPELL. They showed me one that was, I believe, rocket-propelled or jet-propelled. What is that?

General THOMAS. That is more into the Air Force range of things. If we are talking about the same one, that is the CL-289, which has an extended range and a very high speed.

Mr. **Chappell**. What is that called?

General **Thomas**. I am not sure.

Mr. **Chappell**. That is not in your program?

General **Thomas**. That is not. We are looking at that because the Germans are buying it, but currently it is not in our program.

### FIVE-TON TRUCKS

Mr. **Chappell**. What is the status of the five-ton truck program?

General **Thomas**. Sir, the five-ton truck program——

Mr. **Chappell**. In other words, I notice that you don't have money budgeted for the five-ton trucks. I just wondered why.

General **Thomas**. The reason we didn't budget for the five-ton trucks is that we have moneys available from fiscal years 1986 and 1985 which will be applied to the multiyear procurement that is expected to be awarded by the first of May, and therefore we took the fiscal year 1987 resources out since we had prior year funds to use.

Mr. **Miller**. Mr. Chairman, would you yield on that, please?

Mr. **Chappell**. Yes.

Mr. **Miller**. Could you tell us how mnay five-ton trucks were purchased last year and how many five-ton trucks are planned to be purchased this year?

General **Thomas**. I can tell you how many we had in the budget last year, sir, but as I indicated, that money was not obligated.

The number actually delivered against an expenditure level, I will have to provide that for the record, but I believe that was on the order of 21 trucks a day, and that was the procurement that went through this last year, 1985.

[The information follows:]

the Army plans to procure approximately 2097 five ton trucks in fiscal year 1986 and none in fiscal year 1987. Lack of a request in fiscal year 1987 will not cause a break in production. Prior years funding will fund production through FY 87 until fiscal year 1988 monies are available.

Mr. **Miller**. In 1985. Now for the current and coming fiscal years, will it also be 21 trucks a day or just enough to keep the production line rolling?

General **Thomas**. The production line right now is scheduled to have 21 trucks a day through this coming September and then there is an option that will pick up with the Marine Corps and foreign military sales which will continue the production line at 18 trucks a day through February of 19 7, next year.

At that time, we expect the new multiyear procurement to commence its initial production, go through IPT, and ramp up then back to 18 a day about a year later.

Mr. **Miller**. Thank you.

Thank you, Mr. Chairman.

### NEW TRUCK PROGRAMS

Mr. **Chappell**. General, I am sorry I was not here when someone got into the questioning on the trucks before. Is the Army about to embark on new design trucks and a whole family of trucks?

General **Thomas**. Sir, it is our plan to replace the 10-ton HEMTT with a family of heavy tactical trucks in lieu of the 10-ton truck rebuy we presented to the committee last year. We now have a concept evaluation ongoing at Fort Hood and that involves such things as the palletized loading system which we believe will reduce the number of trucks and material handling equipment and also soldiers.

The answer to the question is yes, we are both planning for a medium tactical vehicle and the heavy tactical vehicle.

Mr. CHAPPELL. How long did it take us to perfect the HEMTT truck?

General THOMAS. With the axle and the things we went through———

Mr. CHAPPELL. Yes. You went through a lot of different things that could be attached to it, loading devices and that sort of thing. It took about ten years for that, didn't it?

General THOMAS. It took in excess of 24 months.

Mr. CHAPPELL. My recollection is it took a lot longer than that to get it in production.

General THOMAS. We awarded the contract, sir, in, I believe May of 1981 on that.

Mr. CHAPPELL. That is the production contract.

General THOMAS. Yes, sir, that is the production contract.

Mr. CHAPPELL. You went for a long time before that in development, didn't you?

General THOMAS. The problems were during the initial production testing which was after the contract award. We were not able to field the trucks because there were some fixes that had to be made to the production vehicles.

Mr. CHAPPELL. But that has been done?

General THOMAS. Those fixes have been made.

Mr. CHAPPELL. Is that a good truck?

General THOMAS. The reports that I have is that is a good truck.

Mr. CHAPPELL. Why are we about to get into a new family of trucks? We just got this one into production.

General THOMAS. Do you have the chart on the family of heavy tactical vehicles? I think that is 7507.

[Slide follows:]

UNCLASSIFIED

# FAMILY OF HEAVY TACTICAL VEHICLES
# (FHTV)

| FY | PRIOR | 87 | 88 | 89 | 90 | 91 |
|---|---|---|---|---|---|---|
| **10 TON** (HEMTT) | | | | | | |
| | DELIVERIES | | | | | |
| **FHTV** | | | | | | |
| o PROTOTYPE | | TEST | | | | |
| o PRODUCTION | | | CONTRACT AWD | △ | DELIVERIES | |
| **FUNDING** ($M) | | | | | | |
| o HEMTT[1] | 1146.1 | 234.3 | 70.4 | | | |
| o FHTV | | | | 97.1 | 375.0[2] | 452.0 |

[1] NOTE - HEMTT CONTRACT

[2] NOTE - FURTHER DEFINED BASED ON OTHER FAMILY VARIANTS

Mr. CHAPPELL. Does that involve also the five-ton trucks or the ten-ton trucks?

General THOMAS. We are approaching that as two families, a family of medium and heavy tactical vehicles. The medium tactical vehicle will be a replacement for the five-ton truck and also bring in a replacement for the much needed two-and-a-half-ton truck for which we do not have anything and that is a very old truck.

The heavy tactical vehicle is a family replacement for the ten ton, the GOERS, and a lot of the previous generation which are still there. Basically in the ten ton we plan to proceed with a sole source on the ten ton with the fiscal year 1987 procurement at a minimum economic production rate of six per day.

That six per day then carries through.

We have an optionl to that, we have structured an option to that in 1988 for 396 vehicles. That covers the period and provides the vehicles we need for readiness without any break in production and covers the period in which we would do the testing of prototype vehicles which would be brought to the competition for the Family of Heavy Tactical Vehicle concept.

Mr. CHAPPELL. What is the deficiencies in the trucks that you have. It just got into production. What is wrong with those trucks?

General THOMAS. There is absolutely nothing wrong with that truck as it is. In the family concept, the addition of the palletized loading system will reduce the number of total trucks that we need, will reduce the number of soldiers in those kinds of units.

Also we currently have about 50 percent of the 10-ton trucks series type. Our authorized objective is just over 20,000. We have got to continue to buy that for several more years.

We feel that if we open this up to a non-developmental competition and not restrict it to ten-ton size, but say bring us a family in a range of 8 to 15 tons, that we may get a mix of vehicles and types in a family concept which will allow us to save money and not cost as much because we don't need 10 tons of every application.

Mr. CHAPPELL. I thought that one of the intents in developing your last new truck was to get versatility and the ability to take off one type of equipment and put another on the back of the tractor itself.

General THOMAS. Yes, sir, and in fact we did that with respect to a fuel handling vehicle versus a cargo vehicle versus a wrecker, and versus a tractor.

Mr. CHAPPELL. The Marines have developed a truck similar to yours, but used a whole lot of different devices to be pulled by it. Have you studied that concept? Is that not a meaningful concept?

General THOMAS. Sir, I am not familiar with what you are asking there.

Mr. CHAPPELL. It is a logistic support vehicle that I am talking about made by the same contractor that makes Army trucks. I understand there is not a lot of difference, virtually no difference in the tractor, just in the concept of what you attach to it and how you use the different types of pull vehicles with that tractor.

The trailer itself has a pulling capacity, too.

General THOMAS. Yes, sir.

Mr. CHAPPELL. Are you familiar with that vehicle?

General THOMAS. I am not familiar specifically with what you are mentioning for the Marine Corps. We have with the same contractor—we have the cargo vehicle, we have the fuel handling vehicle. We have the wrecker, and we have the tractor. So we have multiple vehicles now in our own ten ton.

Mr. CHAPPELL. Do you buy fire engines, too? Is that involved in the buy?

General THOMAS. No, sir, not in this buy.

Mr. CHAPPELL. If the Army is not asking for funds this year for five-ton trucks, aren't you going to end up with a production gap somewhere?

General THOMAS. No, sir. The five ton has prior year unobligated moneys which are being applied to the multiyear which is to be let prior to the first of May.

Mr. CHAPPELL. You expect to be able to go under contract by May 1st?

General THOMAS. Yes, sir, we do.

## FAST ATTACK VEHICLE

Mr. CHAPPELL. For several years the Army budgeted to procure fast attack vehicles, so-called dune buggies. Last year, appropriations were denied based on authorization action. Last year's budget forecast a fiscal year 1987 procurement of 241 vehicles for $26.2 million, but no funds are now included in the budget.

Can you tell us why?

General THOMAS. We have gone back to the drawing board on that and right now do not have a requirement for a fast attack vehicle.

Mr. CHAPPELL. Why have you gone back to the drawing board?

General THOMAS. I think—sir, I will have to provide the details of that for the record.

[The information follows:]

A thorough analysis of potential requirements for the Fast Attack Vehicle was conducted by the Army's Training and Doctrine Command from August 1983 until December 1984. This analysis showed that the requirements of all potential light force applications called for a minimum payload capability of 1500 pounds (400 pounds more than the 1100 pound payload of the FAV). This larger payload is necessary for heavy division applications because those divisions habitually need larger crews, more armor protection and a greater amount of equipment to perform their missions. The Light Infantry Divisions also require larger crews in their scout elements because the Light Divisions focus on restricted terrain and are manpower intensive.

As a result of the above, the Army reviewed the in feasibility of procuring only the small number of FAVs needed for fielding its motorized division. Use of the FAV for this single unit was found to be feasible and the motorized division will substitute the HMMWV for its FAV requirements. Although this approach doesn't provide the optional tactical capability, the Army has determined the HMMWV can adequately meet the division's needs.

Mr. CHAPPELL. Are you saying that you don't have a validated requirement for a fast attack vehicle?

General THOMAS. To my knowledge right now we do not, sir, but I will provide the details for the record on the deliberations.

Mr. CHAPPELL. So at this point, as far as you know, there is no intention on the part of the Army to request procurement for a fast attack vehicle in the future?

General **Thomas**. Certainly not in 1987 and it is not in the program years of the budget right now, sir.

## ARMORED COMBAT EARTHMOVER

Mr. **Chappell**. The initial contract award for the ACE is now scheduled for August 1986, very near the end of the fiscal year. The follow-on evaluation for ACE was completed in June 1985. Why is it taking so long to go to the initial contract?

General **Thomas**. Sir, we finished that evaluation and found we had a transmission problem and we had things we wanted to correct that had to do with the number of maintenance hours that that vehicle required.

We, as a part of our deliberations and the ASARC decision on that, which approved procurement of the vehicle, directed that we go back and evaluate the fix of the transmission linkage, which had failed in the test.

We completed the fix and validated it and have just completed a 300-hour demonstration of the ACE with respect to actions taken to reduce the number of maintenance hours on the vehicle. We have worked those things into the request for procurement TDP and feel that the request for procurement will go out clean and not require the updates had we not done this.

So we feel we have cleaned it up up front and can issue a good solicitation which will result in a contract award in August.

Mr. **Chappell**. Are there any high-risk factors that could cause the ACE initial contract award to slip into fiscal year 1987?

General **Thomas**. No, sir. We see it as completely low risk at this time.

Mr. **Chappell**. The Army's multiyear contract request was specifically rejected last year by the Congress.

Please describe the main features of the contracting strategy you are now following and the status of your efforts.

General **Thomas**. As I am sure you have noted, there is a difference in the funding in the 1987 budget as was in the 1987 POM and the 1986 budget that had been budgeted previously based on that multiyear.

We have since changed the acquisition strategy to competitive, single year with options the funding requested reflects that.

The actual acquisition for 1986, from the mark last year which indicated 34 vehicles, was based on the multiyear dollar figures.

In a single year with options, we have determined that a buy of 22 vehicles for the fiscal year 1986 money and 21 vehicles for the fiscal year 1987 money. We are approaching that as a combined 43 vehicles, which will result in a smooth production ramp from the August contract award on up through into a 1988 full-rate production.

Mr. **Chappell**. Are you expecting this competition in this program?

General **Thomas**. Yes, sir. Right now we have had 10 contractors pick up the RFP and have expressed interest in this.

Mr. **Chappell**. Would you list those for the record?

General **Thomas**. Yes, sir.

[The information follows:]

Interested bidders currently are: Pacific Car and Foundry Co., BMY, FMC Corp., American Development Corp., Ingersol-Rand Co., CONDEC, Deere and Co., Teledyne Continental Motors, Demmer Corp., and Royal Ordnance.

Mr. **Chappell**. The funding schedule for ACE shows a strange pattern. It goes from $30.4 million in fiscal year 1987 to $159.1 million in fiscal year 1988 and then back to $102.2 million in fiscal year 1989, and it stays roughly at just over $100 million through fiscal year 1991.

Please explain the reason for the funding spike in fiscal year 1988.

General **Thomas**. Sir, in fact, I saw that spike about a month ago and it is no longer there. We changed that, so we have a smooth ramp up hopefully to 11 per month through the program, and that was just an error on our part.

Mr. **Chappell**. The number of ACE's associated with the $42.4 million appropriated in fiscal year 1986 was 34 last year. This year's budget shows only 22 ACE's in the fiscal year 1986 column.

What is the reason for that?

General **Thomas**. The unit cost last year was predicated on volume, quantities associated with a multi-year contract and also associated with larger quantities. Once that was changed to a single year with options, the number of quantities, particularly in the early years, was reduced because of an absence of a multiyear.

Most contractors are unwilling to amortize their startup costs over the period of that contract with options as they would with a multiyear, so the startup per-unit cost ends up being higher and we get less vehicles.

Mr. **Chappell**. What is the total requirement now for ACE?

General **Thomas**. Sir, the total requirement for ACE right now is 580 vehicles.

Mr. **Chappell**. In 1987, didn't you have a multiyear contract request for 1,318?

General **Thomas**. Yes, sir, the FY 86 PB did have a multi-year.

Mr. **Chappell**. Last year the five-year buy dropped to 580 with 1,033 units projected to be purchased over 12 years. Are you still following that?

General **Thomas**. The current total program quantity is 580, and that reflects a revised requirement and fielding concept for the ACE.

Mr. **Chappell**. You are now buying only about half the ACEs you previously anticipated over five years. Who will be receiving first priority when fielding begins, and who will be receiving last priority?

[The information follows:]

In fielding the first full production vehicles, first priority will be given to the 9th Infantry Division (Motorized) and then to the NATO forward deployed divisional units. The tail of the priority listing will field ACEs to NATO forward deployed corps level engineer organizations.

Mr. **Chappell**. Why don't you provide for the record a complete picture of your fielding plans for the ACE.

[The information follows:]

FORSCOM, the 7th Infantry Division (Light), will be the first unit equipped (FUE) in April 1986 with vehicles from the 11 FY 1982 low rate initial production (LRIP). Full production vehicle fielding will begin in FY 1989 as follows:

FY 1989—9th Infantry Division (Mortorized); 1st Armored Division

FY 1990—3d Infantry Division (Mechanized); 2d Armored Cavalry Regiment; TRADOC (training base); 3d Armored Division, 8th Infantry Division (Mechanized); 11th Armored Cavalry Regiment; 1st Infantry Division (Mechanized); (Forward); 2d Armored Division (Forward); Berlin Brigade; 82d Infantry Division (Airborne); 101st Infantry Division (Air Assault)

FY 1991—2d Armored Division; 1st Infantry Division (Mechanized); 1st Cavalry Division; 155th Brigade (ARNG) (Round Out); 4th Infantry Division (Mechanized); POMCUS

FY 1992—3d Armored Cavalry Regiment; 2d Infantry Division; 24th Infantry Division (Mechanized); 49th Brigade (ARNG) (Round Out); 25th Infantry Division (Light); 10th Infantry Division (Light); V Corps, USAREUR; POMCUS

FY 1993—V Corps, USAREUR, VII Corps, USAREUR, III Corps; POMCUS

FY 1994—5th Infantry Division (Mechanized), 256th Brigade (ARNG) (Round Out); POMCUS

Mr. CHAPPELL. The unit cost for the ACE is $1.9 million in fiscal year 1986 and $1.4 million in fiscal year 1987. Considering even that unit costs drop and production increases over the years, aren't we talking about a bulldozer costing well over a million dollars?

General THOMAS. Our projection over the total program is a million dollars per M-9. That is our current cost estimate.

You are absolutely correct that in the first years the unit cost is higher because of the startup costs with the contractor in a single year with options. We feel with the competition that we have on this in that particular industry, we will achieve that.

Mr. CHAPPELL. There is nothing comparable off the shelf, I suppose, to this vehicle?

General THOMAS. No sir. There is one other vehicle in the world that is for this same purpose, which is a British CET, but it does not meet our requirements.

Mr. CHAPPELL. The British bulldozer—the British have been producing a Combat Engineer Tractor (CET) since 1977. It appears to have capabilities comparable to the ACE.

You say it is not comparable to this and doesn't perform your mission.

General THOMAS. There are some differences, sir. It is overall designed to do the same kind of mission for the British forces that ours does, but there are some differences between the two.

Mr. CHAPPELL. It was used pretty effectively in the Falklands, wasn't it?

General THOMAS. Yes.

Mr. CHAPPELL. What is the cost?

General THOMAS. The cost is in excess of a million dollars.

Mr. CHAPPELL. Our information is that you can purchase them today for about $980,000. The Marines are considering purchasing the CET to meet their requirements.

Why shouldn't the Army treat the CET as a non-developmental item and do the same if it has a proven production record?

General THOMAS. Sir, there are several items that the CET does not do which we feel we require. One thing is the M-9 has an eight-cubic-yard haul capability, which the British CET does not have, the M-9 is air transportable on a C-130 or a C-141. The CET is air transportable after some considerable disassembly.

Perhaps the biggest factor is that the British CET requires two crewmen and the M-9 ACE requires only one, so there is a manpower structure differential between those two which is very significant to us.

And I would just say that the M-9 right now is a non-developmental item. It is finished, and it has gone through a low rate initial production and has been tested.

### ROCKET PROCUREMENT

Mr. CHAPPELL. How many Multiple Launch Rocket System (MLRS) rockets do you intend to purchase by the end of the first multiyear procurement?

General CIANCIOLO. We intend to purchase now 360 somehow, 362,832 over the total program life.

Mr. CHAPPELL. What is the authorized objective for these rockets?

General CIANCIOLO. I believe—the information I have is it is 1,383,340.

Mr. CHAPPELL. How many?

General CIANCIOLO. One million three-hundred eighty-three thousand three-hundred forty, but I will have to double check that, sir.

Mr. CHAPPELL. Why are we buying one fourth of those that you intend to acquire?

General CIANCIOLO. Sir, that was an acquisition objective. Our initial issue quantity is only for the numbers that I gave you before, 362,832 rockets.

Mr. CHAPPELL. The Budget includes $274.2 million for procurement of these rockets and in last year's report the committee expressed its belief that the Army needed to plan for a second multiyear contract so as to assure uninterrupted production and economic rates. The Army was directed to report to the committee on its procurement strategy no later than March 30. Can you give us a preview of your plans at this time?

General CIANCIOLO. I have not seen that plan yet, but the current schedule is to bring it to the Pentagon around the middle of March.

The plan will be brought over here to the Hill by the 30th of March.

Mr. CHAPPELL. What about your recent test failures on this sysytem?

General CIANCIOLO. Sir, in the——

Mr. CHAPPELL. You had some failures, didn't you?

General CIANCIOLO. Yes, sir. The program has what is called a fly-to-buy provision in the multiyear contract where the contractor delivers randomly selected rockets from his production facility to White Sands missile range, where they are then flown against a fly-to-buy contract requirement, and there is a matrix which must be added hereto, so that assuming that the rockets are fired and there are no failures, that volume of rockets then is accepted by the Army for delivery to the Army.

If it is not accepted, then the contractor must repair or fix whatever the difficulty is.

Mr. CHAPPELL. At his expense?

General CIANCIOLO. At his expense, yes, sir. There have been 28 lots of MLRS rockets fired to date, and of those lots that have been fired to date, all but two of those lots—excuse me, 29 lots fired to date. Only three of those lots have been rejected.

The common difficulty we have had with those lots has been the tube covers. When the rocket is fired, it is a sealed round container so the rocket must pass through the cover on the front end and when it does pass through that, some of the rocket covers have been breaking apart in a manner that allows the cover to impact the next rocket that is to be launched, and it has caused some difficulties.

We have gone through a failure analysis of that and it looks like we have now found a fix. The contractor has proposed a fix and that fix is being incorporated into the rockets already delivered to the Army and those that are about to be delivered.

Mr. **Chappell.** Is this fix at this expense?

General **Cianciolo.** Sir, the fix is at his expense totally in the multiyear contract.

In the low-rate production contracts that we have, he is not liable at all in terms of the correction of deficiency clause of the low-rate production contracts.

We have had our procurement officers and lawyers review those contracts and found that he is not responsible for fixing those things that had previously been accepted since we didn't discover those failures until later into the contract in the fly-to-buy program.

However, there has been an arrangement with the contractor, it is a little complex, but essentially what has happened is there are government costs involved because many of these rockets are located at military facilities in ammunition storage areas and the contractor cannot contract with the government at those facilities to provide support equipment like forklifts or a place to make the repairs on-site.

The government's estimate of those support costs are $128,000.

Mr. **Chappell.** If it is his fault, why isn't he required to pay, or are you saying it is the Army's fault?

General **Cianciolo.** It is the Army's fault because he built the rockets to our technical data package and that is the technical data package we approved. We own the technical data package.

But let me continue—the contractor, even though he is not liable under the correction and deficiency clause in those low-rate production contracts has agreed to accept part of the responsibility to pay for those repairs. We have a target cost——

Mr. **Chappell.** Does that mean retrofitting?

General **Cianciolo.** It means retrofitting and we are going to share in that cost, a 30/70 share so that in the final analysis, the contractor is going to pay $288,000 and the government is going to pay $439,000 to fix those rockets that were purchased outside the multiyear contract.

The government will pay nothing for retrofit of the multiyear contract.

Mr. **Chappell.** This is going to slip your schedule.

General **Cianciolo.** No, sir. It will not slip our schedule at all. It has no effect on our schedule.

Mr. **Chappell.** Mr. Dicks has some questions he would like you to answer for the record.

[CLERK'S NOTE.—Questions submitted by Mr. Dicks and the answers thereto follow:]

### M9 ARMORED COMBAT EARTHMOVER (ACE)

QUESTION. The Army conducted a follow-on evaluation (FOE) of the Armored Combat Earthmover (ACE) between March and June 1985. What were the results of the FOE? Are you satisifed that the ACE can perform the mission assigned to it? Have improvements in system maintainability been put in place?

General THOMAS. The Army conducted a very demanding and operationally realistic Follow-On Evaluation (FOE). The FOE results clearly demonstrated the M9's reliability and availability, that its productivity is comparable to that of the Army's commercial T9 medium bulldozer, and that its speed, and tactical mobility contribute to its survivability on the AirLand Battlefield and responsiveness to combat commanders. During the FOE force-on-force field exercise, the M9 consistently met mobility, countermobility, and survivability mission task requirements, enhancing the combat capabilities of the combined arms team.

Improvements to system maintainability have been demonstrated since the FOE and are incorporated in a revised Technical Data Package (TDP). The improvements make the M9 more maintenance friendly and significantly reduce the maintenance burden.

QUESTION. There have been questions raised by some as to the Army's commitment to this program. An ASARC in September 1985 examined in great detail the requirement, the FOE results, and evaluation and the Cost Effectiveness Analysis, according to a letter from Under Secretary Ambrose to Chairman Addabbo, and clearly established the M9 as the preferred alternative. Does this remain the Army position.

General THOMAS. Yes, the Army is fully committed to this program.

QUESTION. This month the 7th Infantry Division (Light) is scheduled to be the first unit equipped (FUE) with the ACE. Will this in fact occur? How many M9s will be assigned to the 7th Division? What vehicles will be used? What other divisions will be equipped with the M9 and when will they receive them?

General THOMAS. M9s will arrive at Fort Ord, CA, this month to meet the 7th Infantry Division requirement, and provide them with an FUE status for April 1986. The Division will receive seven M9s from the FY 1982 buy of fifteen low rate inititial production vehicles. Full production vehicle fielding will begin in FY 1989 as follows:

FY 1989—9th Infantry Division (Motorized); 1st Armored Division.

FY 1990—3d Infantry Division (Mechanized); 2d Armored Cavalry Regiment; TRADOC (training base); 3d Armored Division; 8th Infantry Division (Mechanized); 11th Armored Cavalry Regiment, 1st Infantry Division (Mechanized) (Forward); 2d Armored Division (Forward); Berlin Brigade; 82d Infantry Division (Airborne); 101st Infantry Division (Air Assault).

FY 1991—2d Armored Division; 1st Infantry Division (Mechanized); 1st Cavalry Division; 155th Brigade (ARNG) (Round Out); 4th Infantry Division (Mechanized); POMCUS.

FY 1992—3d Armored Cavalry Regiment; 2d Infantry Division; 24th Infantry Division (Mechanized); 49th Brigade (ARNG) (Round Out); 25th Infantry Division (Light); 10th Infantry Division (Light); V Corps, USAREUR; POMCUS.

FY 1993—V Corps, USAREUR; VII Corps, USAREUR, III Corps; POMCUS.

FY 1994—5th Infantry Division (Mechanized); 256th Brigade (ARNG) (Round Out); POMCUS.

QUESTION. A competitive single year procurement with priced options is slated to begin in FY 1986. What is the status of this contract solicitation? How many firm have bid (are expected to bid)?

General THOMAS. The Request for Proposal (RFP) is scheduled to be released this month with a contract award projected for August 1986. Ten firms have indicated an interest in bidding.

QUESTION. The FY 87 budget calls for 21 vehicles at $30.4 million. This is a lower figure than previous acquisition plans. What is the reason for this production level, and how confident are you that the planned increases in funding for FY 88 and beyond will be supported by the Army.

General THOMAS. Because of the planned late award of both our FY 86 and 87 programs, and the low rate of production during the early months of this program, $30.4M in FY 87 funds will be sufficient to continue production until FY 88 procurement funds are available. Prudent financial management, not lack of Army commitment to the ACE, therefore dictates reduction of the FY 87 Budget Request. Army support for this important program continues.

[CLERK'S NOTE.—End of questions submitted by Mr. Dicks.]

Mr. CHAPPELL. Mr. Livingston also has a couple of questions to be answered for the record.

[CLERK'S NOTE.—Questions submitted by Mr. Livingston and the answers thereto follow:]

## NIGHT VISION GOGGLES

QUESTION. The Army recently awarded two contracts, on a competitive basis, for a 5 year (multi-year) contract to supply substantial quantities of night vision devices, (PVS-5A; PVS-4; TVS-5; VVS-2; aviators goggles and tubes). These are very critical contracts as part of the entire program to give the U.S. Army a total night vision capability.

What has been the impact of the Gramm-Rudman-Hollings FY 1986 sequester on these contracts and the entire Night Vision program?

General THOMAS. There has been no impact on the contracts, but only because the Program Manager-Night Vision Devices was able to solicit sufficient additional orders for Night Vision Goggles from other customers which offset the FY 1986 sequester. However, the Army program to field devices to high priority units is being stretched due to the FY 1986 sequester.

QUESTION. Has there been a "slow-down" or "stretch-out" of these contracts and the entire program from the original contract milestones established prior to Gramm-Rudman?

General THOMAS. Yes, the Army program to field these devices to high priority units has been stretched. The contracts, however, have not been affected, but only because, as I said before, sufficient new customer orders offset the FY1986 sequester.

QUESTION. Has the Army made projections as to the impact on these contracts and the entire Night Vision program if funding in FY1987 remains level in relation to final FY1986 amounts, or if a FY1987 sequester is necessary?

General THOMAS. Funding in FY1987 for those contracts is presently $8.32 million less than funding provided in FY1986 (after Gramm-Rudman sequester). In FY1987, there is a contract funding shortfall of $5.65 million, which will be made up by below threshold reprograming unless sufficient additional customer orders provide the required funds. If a FY1987 sequester occurs, then the Army will have three options: renegotiate or terminate the contract, request Congressional reprograming, or solicit sufficient customer procurements to offset the funding shortfall.

QUESTION. What impact did the FY1986 Gramm-Rudman sequester have on spare parts for these contracts and the entire Night Vision program?

General THOMAS. The effect on spare tubes was negligible because of the relatively small amount of money involved, but the Army program to field these devices to high priority units has been stretched because of the FY1986 Gramm-Rudman sequester.

[CLERK'S NOTE.—End of questions submitted by Mr. Livingston.]

Mr. CHAPPELL. Does anybody have any other questions?

If not, I am prepared to submit the rest of them for the record.

Without objection, then, we will submit the rest of the questions for the record.

[CLERK'S NOTE.—Questions submitted for the record and the answers thereto follow:]

## MULTIPLE LAUNCH ROCKET SYSTEM

### SECOND MULTIYEAR CONTRACT

QUESTION. The budget includes $474.2 million for procurement of the Multiple Launch Rocket System. In last year's report, the Committee expressed its belief that the Army needed to plan now for a second multiyear contract so as to assure uninterrupted production at economic rates. The Army was directed to report to the Committee on its MLRS procurement strategy no later than March 30, 1986.

General Cianciola, will the fiscal year 1988 budget, when submitted, include advance procurement in anticipation of a second multiyear contract so as to avoid a sudden drop in rocket production in fiscal year 1989? If not, why not?

General CIANCIOLO. The fiscal year 1988 budget may or may not contain advance material funding for rockets to be procured in fiscal year 1989 and beyond. The Army is developing its future acquisition strategy for MLRS rockets and will report the results to the House Appropriations Committee by 30 March 1986 as Committee Report 99-332 so directed.

### ADDITIONAL SELF-PROPELLED LAUNCHER LOADER PROCUREMENT

QUESTION. General Cianciolo, we understand that the Army recently decided to procure Self-Propelled Launcher Loaders for an additional 14 batteries. Is this true?

General CIANCIOLO. The FY 87 President's Budget reflects such a Self-Propelled Launcher Loader profile. However, emerging results from analysis of the proper mix of cannons and rocket launchers indicate that MLRS may be the best way of increasing fire power and force effectiveness. This could lead the Army to desire more than 14 MLRS batteries. Such procurement decisions will be presented in the FY 88 President's Budget.

QUESTION. General Cianciolo, why did the Army decide to procure additional SPLL's?

General CIANCIOLO. The Army's ongoing modernization of close battle systems includes improvements to fire support systems. MLRS launchers displayed in the FY 87-FY 90 profile will significantly enhance fire support capability at Corps level. A MLRS battalion provides a threefold increase in fire power over a currently fielded 8" battalion while providing the Corps Commander with additional launchers to attack targets with the terminal guidance warhead and SADARM as well as conduct deep attack with ATACMS.

QUESTION. General Cianciolo, what are the quantities and dollars, by fiscal year, required for the additional SPLL's? What specifically is being procured in fiscal year 1987?

General CIANCIOLO. The SPLL Procurement profile contained in the FY 87 President's Budget is as follows:

| | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|---|
| [illegible] | 11 | 11 | 11 | | |
| [illegible] | [illegible] | [illegible] | [illegible] | | |

From the above data the FY 87 procurement is for 11 SPLLs at $78.3M.

QUESTION. General Cianciolo, what is the deployment plan for these additional SPLL's? Where will they go?

General CIANCIOLO. The SPLL's procured beginning FY 87 (delivery FY 89) will be fielded in Corps MLRS battalions in Europe and CONUS. While the specific details for deployment are yet to be decided, the strategy is to replace less survivable and manpower intensive fire support systems (e.g., 8" Howitzer) with MLRS at no increase in force structure.

QUESTION. These additional SPLL's will have to be procured outside the multiyear contract. Compare the unit costs of the new SPLL's with those procured under the multiyear contract.

General CIANCIOLO. The unit current cost of a SPLL under the current multiyear contract is $1.56M; the cost of a SPLL outside the current multiyear is $1.58M.

**Question.** Why not delay the additional SPLL procurement until the second multiyear?

General **Cianciolo.** The delay of SPLL's until the next multiyear would cause a break in the production line of launchers and cause increased cost which could not be overcome by multiyear savings. Further, the SPLLs are needed to support activation of Corps MLRS units and a break in production would cause untimely acquisition of these weapons.

**Question.** General Cianciolo, why was a decision made to procure more SPLLs without procuring more rockets? When will the Army decide to procure, and fund, additional rockets?

General **Cianciolo.** The decision to procure additional rockets was not made in the submission of the FY 87 President's Budget. This decision will be reflected in the FY 88 President's Budget when the future acquisition stategy for MLRS rockets has been approved.

### MLRS FISCAL YEAR 1987 BUDGET

**Question.** General Cianciolo, the fiscal year 1987 MLRS budget is $13.7 million greater than was the forecast last year. Explain and justify this increase, especially considering the fact that MLRS is under a multiyear contract.

General **Cianciolo.** The fiscal year 86 President's Budget did not forecast the cost of 44 Self Propelled Launcher Loaders which the Fiscal Year 87 President's Budget does reflect. This is the explanation of the increase of $13.7 million. It also reflects that the rocket funding has been reduced by $64.6M to reflect a more favorable escalated price adjustment and inflation cut. The result is a program with the same number of rockets and an increase of 44 launchers at a net increase of only $13.7M.

### MLRS ROCKET DELIVERIES

**Question.** By how much are rocket acceptances behind schedule, and when will acceptances be back on the original schedule?

General **Cianciolo.** The rocket acceptances through Feb 86 are 560 Tactical Launch Pod Containers behind schedule. The projected catch up date is April 86. This is contingent on successful Fly-to-Buy firings.

**Question.** Despite these acceptances failures, the contractor has continued to ramp-up production of rockets. Is this being done with the approval of the Army?

General **Cianciolo.** Modification P00008 of the MY Contract dated 29 Mar 84 permits accelerated deliveries by the contractor. Because of rapid contract build up in deliveries required, the contractor has only been able to accelerate internal fabrication of rockets by one month over those required by the contract.

**Question.** Will the Army continue to test, accept, and pay for rockets which are produced ahead of contract requirements?

General **Cianciolo.** Yes. As a result of an indepth review and discussions, no latent defect or failure of the hardware to meet contract requirements could be determined to exist; therefore, there is no basis for the Government not to accept the hardware.

**Question.** If the contractor continues to produce rockets ahead of the contract schedule, how much sooner will be complete deliveries under the multiyear contract?

General **Cianciolo.** Production of the rocket hardware is projected by LTVAD to be complete in May 90 with the Fly-to-Buy lot acceptance to be completed between Jun 90 and Dec 90. Completion of deliveries is contractually scheduled for Oct 90 for the tactical RPC and Dec 90 for the practice RPC. The delay between production and acceptance is the period of time necessary to conduct the Fly-to-Buy and any required rework of the rockets to make them acceptable.

**Question.** What is the Army doing to prevent these earlier deliveries to result in a "production break" between the first and second multiyear contracts?

General **Cianciolo.** Planning is currently underway to award any follow-on MY Contract in Oct 88 to avoid a production break cost impact.

## JOINT TACTICAL MISSILE SYSTEM

**Question.** General Cianciolo, last year, the Army projected that fiscal year 1987 funds would be requested for the Joint Tactical Missile System. None are requested, and none are now shown for fiscal year 1988. What is the status of this program? Does the absence of a procurement request indicate technical problems, or some change in stated requirements? When does the Army anticipate that procurement funds will be requested?

General **Cianciolo.** This program, renamed the Army Tactical Missile System, underwent ASARC and DSARC reviews in Dec 85 and Feb 86 respectively. We expect to sign a Full Scale Development (FSD) contract late March or early April 1986. The absence of a procurement request in fiscal years 1987 and 1988 does not indicate technical problems with the program or a change in stated requirements. The fiscal year 1987 budget submission supports an Initial Operational Capability of ———. To support this IOC, procurement funding would be requested for fiscal year 1989. Since the operational capability that Army TACMS will provide is urgently required, the Army is investigating options available to accelerate this effort. A final determination will be made after contractor source selection is completed and actural contractor costs are known.

## MISSILE SPARES AND REPAIR PARTS

**Question.** The Congress provided $312 million for Missile Spares and Repair Parts for fiscal year 1986. Why does the fiscal year 1987 budget show only $286.8 million for fiscal year 1986? What happened to $25.2 million?

General **Cianciolo.** A reduction of $10 million was applied for Missile Component Breakout as directed by the House Appropriations Committee. $15.2 million reduction was applied as part of the Inflation Fairness Adjustment as approved by the Appropriations Committee.

**Question.** The HAC did not apply the reduction to spares, as this sentence applies. Why wasn't the reduction applied to individual missile programs as was the obvious intent?

General **Cianciolo.** The reduction was applied to spares since it was assumed that the decrement was due to the fact that some repair parts are procured in combination with major end items on sole source contracts. If separated, spares could be procured competitively at a cost savings.

**Question.** Last year, the projected fiscal year 1987 requirement for Patriot initial spares was $105.6 million. Why are $37.1 million requested? How has the requirement changed?

General **Cianciolo.** The FY 1987 Patriot spares requirement is $63.8 million of this amount. $26.7 million was deferred to FY 1988 based on the Army's inability to fully obligate the previous year program. The remaining difference between the original request of $105.6 and the current request of $63.8 is attributable to the recomputation process based on revised deployment schedules for the major item, upon which initial spares requirements are based, in FY 1988 and FY 1989.

**Question.** Last year, the projected fiscal year 1987 requirement for Replenishment Spares was $142.1 million. Why are $83.0 million requested? How has the requirement changed?

General **Cianciolo.** The FY 1987 Replenishment spares requirement has decreased by $59.1 million. This decrease is attributable to a $19.0 million reduction due to the Army's inability to fully obligate the previous year program; $8.4 million reduction to war reserves based on Army decision that the previous planned sustainability level was not affordable in Fy 1987; $27.4 million reduction in overall requirements based on normal recalculation processes; the remainder is attributable to the application of revised inflation factors.

**Question.** Overall, the total request for missile spares and repair parts is less than half of last year's projection ($150.9 million vs. $319.6 million). Is this a case of sacrificing readiness and sustainability in favor of procurement of more new items?

General **Cianciolo.** While it may appear that readiness and sustainability are being sacrificed, such is not the case. The prime driver's of the reduction are (1) A directed reduction of $66.0 million due to Army's inability to fully obligate the previous year program and (2) the normal recalculation process reduced the spares requirements ($76.0 million) based on changes in and item deployment schedules, upon which initial spares are based. In addition, the war reserve funding was reduced ($8.4 million) based on an Army decision that the previous planned sustainability level was not affordable. The remainder ($8.3 million) is attributable to the application of revised inflation factors.

## COMPONENT BREAKOUT

**Question.** Last year, the Congress made a token general reduction in the request for Army missile procurement, identified as being for "component breakout". The intention was to encourage the Army to seek cost savings by increased use of component breakout in missile procurement programs. This step was taken in light of two IG reports, issued in April 1982 and March 1985, which criticized a sole-source mentality and lack of initiative.

What specific steps in which missile programs have been taken to implement component breakout?

General CIANCIOLO. All of the Projects and procurement activities at the Missile Command are actively pursuing cost savings resulting from the breakout of components for competition. Some examples of the estimated savings already generated are:

| System | Item | Estimated savings |
|---|---|---|
| Air Defense Targets | Engines | FY 86 $2,867,040 |
| | Airborne units | FY 86 $3,373,325 |
| Chaparral | FLIR Interface Kits | FY 85 $4,320,000 FY 86 $5,800,000 |
| | Test Set Mod Kits | FY 85 $1,250,000 |
| | Cooling Kit | FY 85 $1,000,000 |
| | NBC Mod Kit | FY 85 $300,000, FY 86 $310,000 |
| | Antenna Cable Group | FY 85 $220,000 |
| Pershing | Various Assemblies | FY 86 $3,353,210 |
| Patriot | Numerous Components | FY 86 $21,100,000 |
| Hellfire | Transport and Storage Containers, Deicing Adapter Assembly, Dummy Missile, Launcher | FY 85 $39,300,000 |
| Land Combat Support System | Prod Improvement Hardware | FY 85 $1,913,948 |

QUESTION. What total savings in missile programs does the Army anticipate in each of the fiscal years 1986 through 1991 as a result?

General CIANCIOLO. The savings on which missile programs will be predicated in the future are in the range of $70-80 million a year. Missile procurement programs have been reduced for planning purposes to reflect these savings, both known and projected.

QUESTION. What steps has the Army taken to increase the use of component breakout in other procurement activities, in addition to missiles.

General CIANCIOLO. Like the Missile command, all Army procurement activities are taking aggressive action to break out components in order to obtain the best possible price.

## TEN TON TRUCKS

QUESTION. What are the unit costs of the fiscal year 1985 option quantities, by vehicle type, and what unit costs are assumed in your fiscal year 1987 procurement?

General THOMAS. The escalated hardware unit costs are:

| | FY85 Option | FY87 |
|---|---|---|
| Cargo, M977 W/W | | 141,986 |
| Cargo, M977 WOW | 132,256 | 136,794 |
| Tanker, M978, W/W | 165,737 | 171,424 |
| Tanker, M978, WOW | 158,801 | 164,250 |
| Wrecker, M984E1 | 193,729 | 200,376 |
| Cargo, M985, W/W | 146,167 | 151,182 |
| Cargo, M985, WOW | 139,115 | 143,888 |
| Tractor, M983, W/O Crane | | 120,367 |

The above prices include engineering change costs which apply equally to both years. But they do not include Federal Excise Tax (FET), which applies only to those vehicles which stay in the continental United States and this amounts to approximately 13% of hardware cost. Nor do they include support costs (government engineering, product/quality assurance, testing and documentation).

Question. The Army will begin procuring a new family of heavy tactical trucks in fiscal year 1989. What validated, approved requirement exists for the new truck?

General Thomas. An O&O plan for Palletized Load System was approved 20 Dec 83. A Required Operational Capability (ROC) is due HQDA 2QFY86 in full support of the planned acquisition strategy.

Question. What procurement strategy will be used for the new truck?

General Thomas. The Family of Heavy Tactical Vehicles (FHTV) is planned to be procured by a Non-Developmental (NDI) competitive, five year multiyear procurement beginning in fiscal year 1989. Prototype testing in support of production contractor source selection will be conducted during FY 87-88. The FHTV is not a developmental program but leverages on current industry technology and use of proven commercial components.

Question. How many will be procured, and over what time frame?

General Thomas. Current plans are to award a competitive multiyear contract beginning fiscal year 1989. Initial production will be the Palletized Loading System (PLS) vehicles. Total quantities of PLS and other heavy family variants to be procured are still being determined.

Question. Why can the Army not postpone additional HEMTT procurement until the future truck is ready?

General Thomas. The Army has a continuing need for 10 ton trucks to support the fielding of force modernization systems. No 10 ton truck production from FY 87 until the start of Family of Heavy Tactical Vehicle (FHTV) production in FY 89 will cause a delay in availability of vehicles required to support these important modernization programs. The Army is planning to procure only the minimum required to support these systems such as the Multiple Launch Rocket System (MLRS), M1 and M1A1 Tanks, Apache Helicopter and the PATRIOT Missile system. The balance of the requirements are being deferred until the FHTV is available.

Question. The ten ton truck budget decreases to $70.4 million and 396 vehicles in fiscal year 1988. Explain this sharp drop in procurement quantity.

General Thomas. The sharp drop in procurement quantity is primarily due to Army procurement priorities. The FY 88 program will be used to purchase only the highest priority HEMTT 10 ton requirements in anticipation of the Family of Heavy Tactical Vehicles (FHTV) production starting in FY 89.

Question. For the record, provide the monthly deliveries for the fiscal years 1985, 1986, 1987, and 1988 funded delivery periods.

General Thomas. The following schedule is provided for deliveries funded by Other Procurement, Army/Budget Activity 1—Tactical and Support Vehicles:

| | 1985 | 1986 | | 1987 | 1988 |
|---|---|---|---|---|---|
| Dec 85 | 17 | | Nov 87 | 90 | |
| Jan 85 | 88 | | Dec 87 | 66 | |
| Feb 86 | 86 | | Jan 88 | 132 | |
| Mar 86 | 101 | | Feb 88 | 132 | |
| Apr 86 | 96 | | Mar 88 | 132 | |
| May 86 | 97 | | Apr 88 | 132 | |
| June 86 | 104 | | May 88 | 132 | |
| Jul 86 | 78 | | Jun 88 | 132 | |
| Aug 86 | 92 | | July 88 | 66 | |
| Sep | 92 | | Aug 88 | 132 | |
| Oct 86 | 92 | | Sep 88 | 132 | |
| Nov 86 | 68 | | Oct 88 | 132 | |
| Dec 86 | 58 | | Nov 88 | 113 | 19 |
| Jan 87 | 25 | 30 | Dec 88 | | 66 |
| Feb 87 | 25 | 55 | Jan 89 | | 132 |
| Mar 87 | 25 | 67 | Feb 89 | | 132 |
| Apr 87 | 30 | 56 | Mar 89 | | 47 |
| May 87 | | 80 | | | |
| Jun 87 | 11 | 70 | | | |
| Jul 87 | 30 | 32 | | | |
| Aug 87 | 40 | 32 | | | |
| Sep 87 | 35 | 37 | | | |
| Oct 87 | | 72 | | | |
| Nov 87 | | 47 | | | |
| Dec 87 | | 11 | | | |
| Total | 1,290 | 584 | | 1,523 | 396 |

This schedule differs slightly from data contained in the Committee Staff Procurement Backup Book.

[CLERK'S NOTE.—End of questions submitted for the record.]

Mr. **CHAPPELL.** Gentleman, thank you very much. We appreciate your testimony.

The Committee will stand adjourned until 10:00 Tuesday.

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TUESDAY, MARCH 11, 1986.

# WEAPONS AND COMBAT TRACKED VEHICLES, ARMY

## WITNESSES

**BRIGADIER GENERAL JERRY HARRISON, DEPUTY DIRECTOR OF WEAPON SYSTEMS, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT, AND ACQUISITION, UNITED STATES ARMY**

**COLONEL J. B. HOLEMAN, CHIEF, GROUND COMBAT SYSTEM, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT AND ACQUISITION, UNITED STATES ARMY**

**LIEUTENANT COLONEL RAY W. KAUFFMAN, CHIEF, LIGHT COMBAT VEHICLE TEAM, WEAPON SYSTEM DIRECTORATE, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT AND ACQUISITION, UNITED STATES ARMY**

## OPENING STATEMENT

Mr. CHAPPELL. The committee will please come to order.

This morning the Committee considers the budget estimate for the Army's Procurement of Weapons and Tracked Combat Vehicles appropriation. The amount requested for this appropriation in fiscal year 1987 is $4,455,245,000, a decrease of $2,645,000 from the amount appropriated in fiscal year 1986 after sequestration.

Two programs, the M1 tank and the Bradley Fighting Vehicle consume about three quarters of the total appropriation. A total of $487.4 million is budgeted for spares.

The principal witness is Brigadier General Jerry C. Harrison, Deputy Director of Weapons Systems, Office of the Deputy Chief of Staff for Research, Development, and Acquisition.

General Harrison, you have submitted a prepared statement which will be inserted in the record. In the interest of time, we ask that you briefly summarize it and then we will proceed to questions.

General HARRISON. We are very happy to be here. Before I get into the summary of the statement, I would like to pass along my personal best wishes and that of the Army for the speedy recovery of Chairman Addabbo.

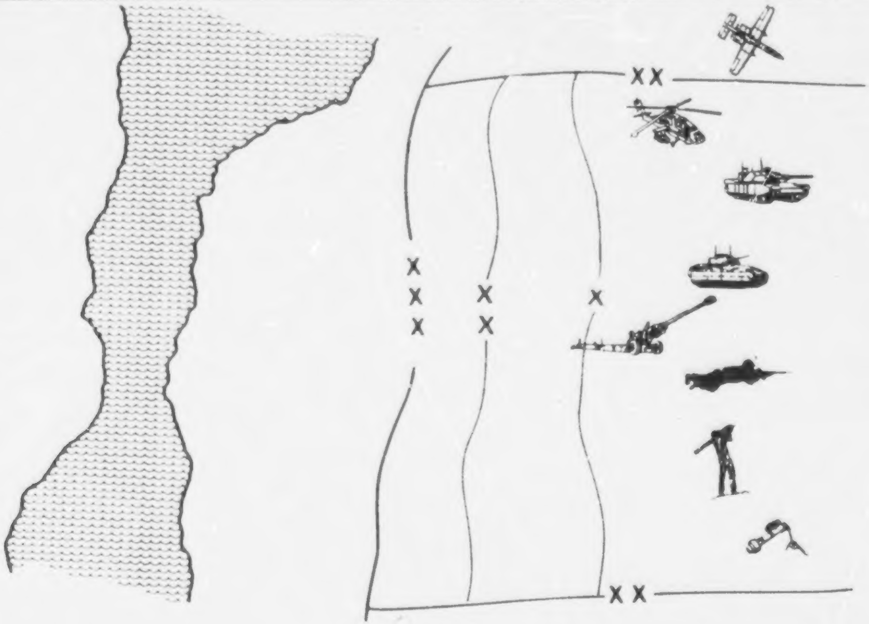
I am accompanied by Colonel J. B. Holeman, Chief of the Combat Systems Division in ODCSRDA, and together we will answer all your questions.

### OVERVIEW

I would like to focus on the soldier. This is why we are here, in my view. He is the recipient of our R&D and procurement. This is what it is all about. He is the guy who fights the Bradley, fires the weapons. He or she is why we are here. They are the best soldiers in the world. I am pleased to serve with them, and I want to provide them the best equipment that we can.

[Chart follows:]

# COMBINED ARMS TEAM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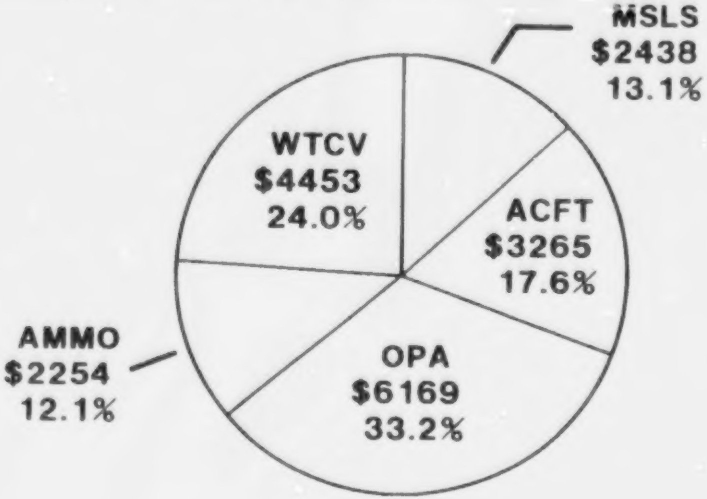
**General HARRISON.** I would like to show you how this fits together. What I am talking to you about this morning is the core of the land combat, the tank, the Bradley, the Howitzers, the indirect fire weapons, the individual and crew served weapons. This is the combined arms team; it is on the battlefield where it fights, and I like to put everything in perspective to show how it works as a team. It is not one system but several working together.

[Slide follows:]

## FY 87 PRESIDENT'S BUDGET
## PROCUREMENT - BY APPROPRIATION
## $ - MILLIONS

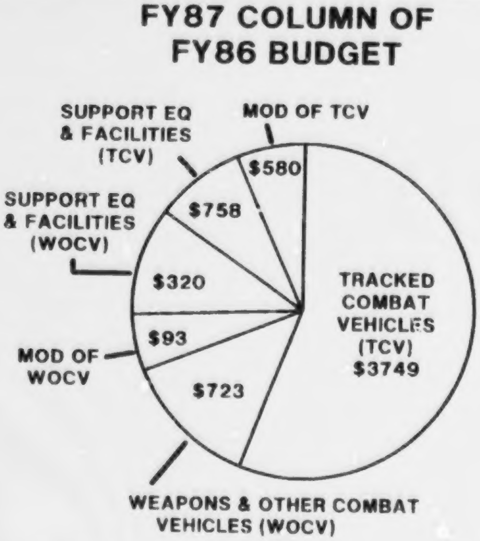


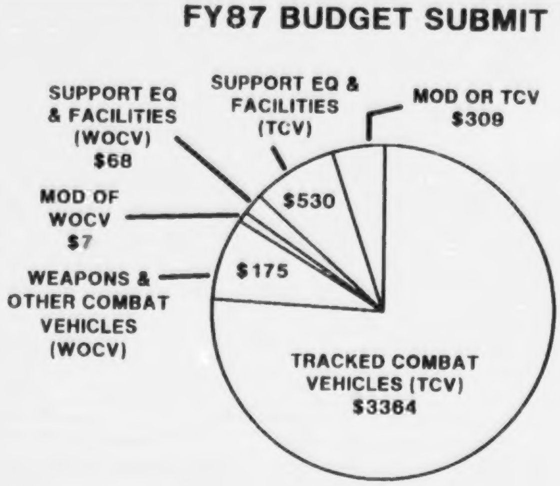
General **Harrison**. I would like to get into the dollars and cents. Let's look at the appropriation for fiscal year 1987 for weapons and tracked combat vehicles, $4.5 billion which is 24 percent of the total Army procurement budget of $18.6 billion.

[Slide follows:]

# PROCUREMENT BUDGET COMPARISON - WTCV

($000,000)


FY87 COLUMN OF FY86 BUDGET


FY87 BUDGET SUBMIT

B236.99 **$6223** **- $ 1770** **$4453**

General **Harrison**. The next chart compares last year when we told you what we were going to ask for projected for 1987 and what you see in 1987 in the budget submitted to you. There is a difference of $1.77 billion between those two. I would like to just highlight that.

Across the Army in the procurement and development appropriation from last year's budget to this year, there was a $6.3 billion decrease. We took our proportionate share of that. A large amount of that reduction was due to the cancellation of the Sergeant York system.

We also had affordability reductions within the Army. We took our share of that. There was a decrease in spares, we had the elimination of the M88A1 recovery vehicle, and we scrubbed the M1 budget bringing down the amount of money in that line while maintaining procurement of the same number of tanks.

Mr. **Chappell**. While you have the chart there, let's stop for a minute. I notice you have had a tremendous decrease in your support facilities. Why such a tremendous cut in support facilities?

General **Harrison**. Sir, that is primarily in spares and support, mostly in spares.

### Spares

Mr. **Chappell**. Why are you cutting so much in spares? Were you in error before in estimating the spares that you were expecting to need, or is this because of the budget crunch?

General **Harrison**. Sir, a big piece of that was Sergeant York spares. We also, to put the total picture, the war reserve spares that are out of there as a result of affordability reductions, but the Sergeant York is a big piece of that.

Mr. **Chappell**. When you say weapons and other combat vehicles, Sergeant York is the big one.

General **Harrison**. That is where Sergeant York was, sir. I would like to look at several individual systems and I will only highlight some out of the statement.

[Slide follows:]

- LETHALITY IMPROVEMENT WITH 120MM GUN
- SURVIVABILITY ENHANCEMENT WITH IMPROVED ARMOR AND NBC SYSTEM
- FIRST M1A1 DELIVERED AUG 1985

| | FY85 & PRIOR | FY86 | FY87 | FY88 | COMPLETE FY89 | TOTAL |
|---|---|---|---|---|---|---|
| RDTE | 1258.6 | 40.4 | 34.7 | 25.4 | 0 | 1359.1 |
| PROC* | 9632.8 | 1945.7 | 2115.9 | 2202.8 | 2055.1 | 17952.3 |
| QUANTITY | 4168 | 840 | 840 | 840 | 779 | 7467 |

*INCLUDES INITIAL SPARES

## M1 TANK

General **Harrison**. This is the best tank in the world, the M1. The key elements that we are looking to improve in procurement quantities and dollars. This is our ninth year of production of this tank.

Also during fiscal year 1987, we will start funding the block-2 modifications which will give us a thermal viewer for the commander, an improved range finder, and improve the battle management system.

In 1986, this year, we are looking to improve the track. We have track tests going on that will resume this spring.

We are also doing vulnerability testing starting this month of the M1 tank as we have done on the Bradley where we will fire against a full-up combat loaded vehicle.

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- FY87 - EIGHTH YEAR OF BRADLEY PRODUCTION
- TROOPS LIKE THE VEHICLE AND ITS CAPABILITIES
- VULNERABILITY TESTING WAS USEFUL AND SHOULD BE CONTINUED
- FY87 RDTE - BLOCK II MODS, IMPROVED ARMOR PROTECTION, SPALL LINERS, IMPROVED VEHICLE SURVIVABILITY

| | FY85 & PRIOR | FY86 | FY87 | FY88 | TO COMPLETE | TOTAL |
|---|---|---|---|---|---|---|
| RDTE $ | 414.7 | 23.6 | 19.9 | 13.9 | CONT | CONT |
| PROC $ | 4417.7 | 933.5 | 1142.4 | 1176.8 | 1836.1 | 9506.5 |
| QUANTITY | 2955 | 716 | 870 | 870 | 1471 | 6882 |

B236.113

## BRADLEY FIGHTING VEHICLE

General **Harrison**. The next system the Bradley is the teammate for the Abrams. This is the eighth year of production. The troops like this vehicle, and I am a troop, I like it. It fights well. It has a lot of capability.

We have done vulnerability testing that has received a lot of press. I am willing to talk about that.

We have a system in the field that has tremendous agility, firepower with TOWs, 25 millimeter cannon and a 7.62 machine gun.

I would like to summarize as far as the Bradley is concerned, the way we feel about this. We have a great vehicle. We are fielding a battalion's worth a month. It is much better than anything we have ever had.

We have been doing vulnerability testing on it. We have learned from that testing, and we are going to make a good vehicle even better and give our troops a more capable and survivable vehicle.

We have run war games and fought with it at the National Training Center, it comes down to, with Bradley you win and without it you lose.

We feel strongly about the Bradley and ask for your support.

Mr. **Chappell**. What weapons do you have on the Bradley?

General **Harrison**. A TOW system on the upper right, whose missiles will go out to 3750 meters and take out a tank. The 25-millimeter gun is right here. That goes out in excess of 2000 meters and will penetrate a Soviet armored personnel carrier.

Then you have a coaxially mounted 7.62 mm machine gun. That provides a lot of fire power for the infantry.

Mr. **Chappell**. Is that the prime mission?

General **Harrison**. No, sir, it is one of the prime missions. The other is to carry the infantrymen to battle. These missions support each other.

[Slide follows:]

- **PROGRAM FUNDS SURVIVABILITY ENHANCEMENTS FOR M60A3**
- **ENHANCEMENTS INCLUDE APPLIQUE ARMOR, AUTOMATIC FIRE SUPRESSION SYSTEM, LASER PROTECTION**
- **MAJORITY OF M60A3'S TO EQUIP RESERVE COMPONENT**

| | FY85 & PRIOR | FY86 | FY87 | FY88 | TO COMPLETE | TOTAL |
|---|---|---|---|---|---|---|
| **RDTE $** | 71.2 | 3.5 | 1.1 | 2.2 | - | 78.0 |
| **PROC $** | 2533.0 | 105.2 | 48.3 | 77.6 | 119.5 | 2883.6 |
| **QUANTITY** | 5136 | 264 | - | - | - | 5400 |

B236.117

### M60A3 TANK

General **Harrison**. The next system I would like to show you is also in the tank family, our M60A3 that has been around a while. I will highlight the second bullet there, that talk about survivability and enhancements.

You heard me talk about that in the Bradley and the tank, in the M60A3 tank, we are focusing on survivability and these are the MOD kits to improve that, the applique armor and laser protection.

[Slide follows:]

- ESSENTIAL FOR TANK RECOVERY AND EVACUATION
- FY86 COMPLETES M88A1 PRODUCTION
- FY87 FUNDS ADVANCED PROCUREMENT FOR IMPROVED M88A1
- M88A1 PIP ESSENTIAL TO SUPPORT MODERN TANK FLEET

| | FY85 & PRIOR | FY86 | FY87 | FY88 | TO COMPLETE | TOTAL |
|---|---|---|---|---|---|---|
| RDTE $ | 1.9 | 8.0 | 9.4 | 7.8 | | 27.1 |
| PROC $ | 1002.0 | 199.4 | 42.8 | 121.1 | 1775.8 | 3141.1 |
| QUANTITY | 2246 | 233 | N/A | 100 | 1283 | 3862 |

B236.101

### M88 RECOVERY VEHICLE

General **Harrison**. Next is the M88 recovery vehicle. We have a situation where we are fielding heavier tanks, the M88 has been around awhile. We need to improve it so it can safely haul the M1A1 tank so we are asking for advanced procurement to buy the items we need for product improvement of this work horse.

[Slide follows:]

M577
COMMAND POST CARRIER

- FY87 PROCUREMENT OF M577A2 FILLS FORWARD DEPLOYED UNITS AND FOUR POMCUS SETS
- NO FY87 PROCUREMENT OF M113A3
- PROCUREMENT STRATEGY PROVIDES LOW VOLUME PROCUREMENT OF 300-400 VEHICLES PER YEAR TO:
  - REDUCE SHORTAGES
  - PROVIDE A STABLE PRODUCTION LINE

| | FY85 & PRIOR | FY86 | FY87 | FY88 | TO COMPLETE | TOTAL |
|---|---|---|---|---|---|---|
| RDTE $ | 17.3 | 4.3 | 0 | 0 | 0 | 21.6 |
| PROC $ (113A3) | 813.6 | 117.7 | 0 | 80.8 | CONT | CONT |
| QUANTITY | 20665 | 451 | 0 | 300 | CONT | CONT |
| PROC $ | 246.3 | 30.6 | 64.1 | 0 | CONT | CONT |
| QUANTITY (M577A2) | 4543 | 144 | 300 | 0 | CONT | CONT |

248

## M113 SERIES VEHICLES

General **Harrison**. The next system is the M113 series of vehicles. I only highlight this to tell you we have changed our procurement strategy on this. We are now buying 300 to 400 vehicles of a single type per year. We are short in the Army, so we are concentrating on a particular type each year, and that gives us a stable production line.

This year we are asking for 300 command post carriers, M577's.

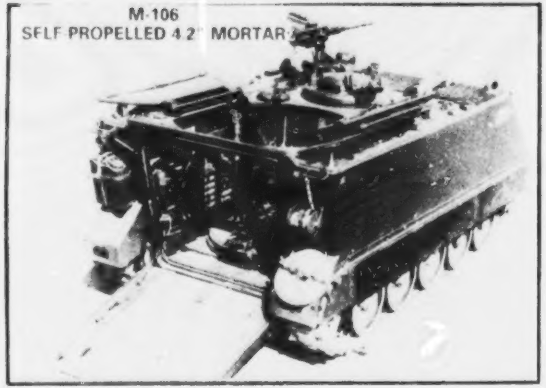
Mr. **Chappell**. That is a command post vehicle?

General **Harrison**. Yes.

Mr. **Chappell**. How many people?

General **Harrison**. Generally, you will operate with three to four inside. In operation, you have the driver and two, three or four people inside, but it is mainly for the command post when you get it set up.

[Slide follows:]



M-106
SELF PROPELLED 4.2" MORTAR

- FY87 CONTINUES PROCUREMENT OF BLK MOD I SURVIVABILITY UPGRADES (EXTERNAL FUEL TANKS, SPALL LINERS, RISE POWER) AND IMPROVED COOLING AND SUSPENSION KITS
- BEGINS PROCUREMENT OF BLK MOD II KITS (EXTERNAL ARMOR)
- COMPLETES PROCUREMENT OF M548 CARRIER ACCESS PANELS

| | FY85 & PRIOR | FY86 | FY87 | FY88 | TO COMPLETE | TOTAL |
|---|---|---|---|---|---|---|
| **RDTE $** | - | - | - | - | - | - |
| **PROC $** | 355.6 | 54.7 | 48.4 | 61.5 | CONT | CONT |
| **QUANTITY** | - | - | - | - | - | - |

B236.103

General **Harrison**. The M113 family of vehicles. Again you see at the top survivability, modifications to include the external fuel tanks and spall liners and so you understand what "spall" is, if you hit an armored vehicle with a projectile inside you get a spray of fragments which is the spall. If we can reduce that by putting liners inside so that all you get through is the jet or the bullet, then we can save soldiers' lives.

We are doing that here and we are going to test that in the Bradley. Those are spall liners, very important to save soldiers' lives.

[Slide follows:]

- INCREASED RANGE - INCREASED LETHALITY
- RAM 4-FOLD INCREASE OVER PRESENT HOWITZER
- OPERATIONAL TESTS COMPLETED JUL 85
- TYPE CLASSIFIED STANDARD DEC 85

| | FY85 & PRIOR | FY86 | FY87 | FY88 | TO COMPLETE | TOTAL |
|---|---|---|---|---|---|---|
| RDTE $ | 9.1 | 6.4 | 0 | 0 | 0 | 15.5 |
| PROC $ | 0 | 0 | 26.5 | 32.0 | 87.3 | 145.8 |
| QUANTITY | 0 | 0 | 64 | 120 | 300 | 484 |

B236.107

### HOWITZER FAMILY

General **Harrison**. The next system is the Howitzer family, the M119 light gun. This is the first year. We are asking for procurement of 64 weapons. It improves the firepower for light divisions, increases the range and lethality and we get much better reliability, maintainability, availability, and we are asking for current dollars to buy 64 tubes purchased from the United Kingdom for the first buy and we will start bringing production on shore.

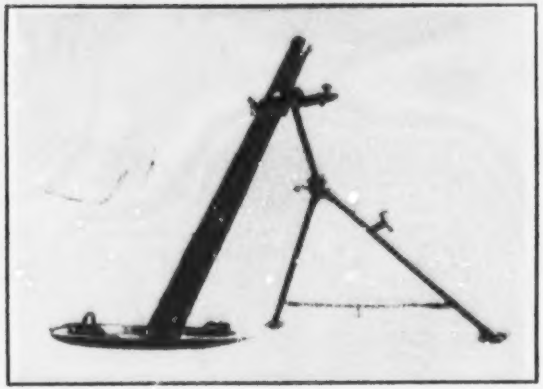
Mr. **Chappell**. What is the range of the gun?

General **Harrison**. Fourteen point five (14.5) kilometers with the basic ammunition. That is about 8.5, 8.6 miles, sir. It will go 19½ kilometers with a rocket assisted projectile, which is being developed for it, so that will give us significantly more capability and that is almost 12 miles.

We are also working with the HELP/HIP program for the 155 improvements.

This is the mortar family which I would like to talk about, the 120 millimeter. Last year, at this time, I couldn't have told you that we had a good mortar plan and that it was all pulled together. In fact, Congressmen McDade and I discussed that last year.

[Slide follows:]



- ARMY MORTAR MASTER PLAN ADOPTED JUL 85
- NON DEVELOPMENTAL ITEM
- COMPETITIVE SHOOT-OFF MAY-AUG 86
- SOURCE SELECTION AUG 86
- 9 ID IOC APR 87

|  | FY85 & PRIOR | FY86 | FY87 | FY88 | TO COMPLETE | TOTAL |
|---|---|---|---|---|---|---|
| RDTE $ | 2.9 | 8.0 | 4.6 | 0 | 0 | 15.5 |
| PROC $ | 0 | 5.0 | 13.2 | 22.4 | 154.1 | 194.7 |
| QUANTITY | 0 | 63 | 145 | 267 | 1780 | 2255 |

### MORTARS

General HARRISON. This year we have a plan put in effect since July of 1985. We are looking to buy this item as it stands from one of the competitors and produce it and put it in the 9th Division by April 1987.

We are ready to receive the contractors' bids and their test packages and we will bring them and shoot them off and see who has the best one.

This is the first big procurement of that weapon system. We are also continuing to buy the improved 81-millimeter mortar in accordance with the mortar master plan.

[Slide follows:]

The Ultimate
9mm Sidearm
Beretta 92SB-F

- CONTRACT AWARDED TO BERETTA USA 10 APR 85
- SECOND YEAR OF FIVE YEAR MULTI-YEAR PROCUREMENT
- SUCCESSFULLY COMPLETED FIRST ARTICLE TEST
- TECH DATA PACKAGE AVAILABLE NOV-DEC 86
- FIELDING BEGINS IN APR 87

| | FY85 & PRIOR | FY86 | FY87 | FY88 | TO COMPLETE | TOTAL |
|---|---|---|---|---|---|---|
| RDTE $ | 0 | 0 | 0 | 0 | 0 | 0 |
| PROC $ | 9.1 | 7.5 | 4.4 | 5.1 | 78.5 | 104.6 |
| QUANTITY | 30000 | 25400 | 21219 | 23418 | 205645 | 305682 |

B236.112

### SMALL ARMS

General **Harrison**. The next system, small arms, you can't see this too well. This is the 9-millimeter pistol that we are buying. We are in the second year of a five-year multiyear procurement. We have just completed the first article testing of the pistol and we intend to start fielding it in April of 1987.

It seems to be going well. We will bring the procurement on shore in fiscal year 1988, and we have got a good piece of equipment here. We had good competition, we saved the Government some money, and we have a good pistol.

We are asking to continue to buy in the small arms area the M16A2 rifle, the squad automatic weapon, and we are initiating another procurement of the M60 machine gun, which is highlighted in my statement.

Back to the fellow that brings this all together, our most precious commodity, and why we are here in my view, again, the finest soldier in the world. You and I have the distinct honor of providing him the best equipment in the world, and that is what I am in business to do.

I am here to answer any questions that you may have this morning, sir. That completes my statement.

### Allocation of General Reductions

Mr. **Chappell**. In fiscal year 1986, Congress included inflation-related unallocated reductions of $206.7 million in this appropriation. How did the Army go about allocating this reduction?

General **Harrison**. Sir, we looked at every program in this appropriation and there were two or three programs that we decided to reduce more than a strictly salami: Slice inflation reduction.

Those two were specifically the M240 machine gun and the ROBAT. So from those programs, we took $25 million, the Mark-19 was another we made a reduction in for $9 million, so there were several programs that immediately we could take from. We tried to look at protecting the programmatics and quantities and spread it as best we could. For the Bradley, it was $15.4 million; the M1, $15.6; spares, $47.5 million.

We worked with OSD, looked at each program, and we made the cuts as best we could using smart business management, and what we needed in the field.

Mr. **Chappell**. It was the intent of the Committee that these reductions be applied to excess inflation budgets and have no programmatic impact.

Were any procurement quantities affected by these reductions?

General **Harrison**. None other than I have already talked about, sir. The quantities that we, for example, in the Mark-19 and the ROBAT that we had already for other reasons had taken those programs out of the budget and we just applied that to offset some of that so, no, other than those programs, no quantities were cut.

Mr. **Chappell**. In three instances, the application of general reductions has resulted in the elimination of a procurement line. For example, last year Congress appropriated $9.6 million for the initial procurement of the Robotic Obstacle Breaching Assault Tank (ROBAT). The Army claimed that ROBAT was required because "present engineering systems are incapable of providing adequate countermine support required by heavy combat forces on the modern battlefield."

Why has ROBAT now apparently been cancelled?

General HARRISON. Affordability, sir.

Mr. CHAPPELL. Strictly affordability?

General HARRISON. Yes, sir.

Mr. CHAPPELL. Why did the application of the general reductions eliminate all funding for the M240 armor machine gun?

General HARRISON. Sir, we were buying more than we needed.

Mr. CHAPPELL. Why did the application of the general reduction eliminate all funding for the MK-19 40-millimeter grenade launcher?

General HARRISON. After budget submission, our requirements dropped on that and affordability also, but those decisions were made prior to receiving the general reductions.

## NEW FAMILY OF ARMORED VEHICLES

Mr. CHAPPELL. General Wickham testified last month that the Army is studying whether to develop and procure a new family of armored vehicles. The study is being chaired by Major General Robert Sunell, a former tank program manager.

When will this study be completed and when will the Army decide its future armored vehicle program?

General HARRISON. Sir, the final study report is due in August of 1987. We will be getting continual updates from General Sunel as he pulls together this whole armored family of vehicles to decide what we need to do now, what we need to concentrate on first to include what are we going to do with the M1 tank production line because that goes cold on us and we have to decide whether we continue that and how that folds into the family of vehicles.

General Sunell has been tasked to look at that and his most immediate problem is to tell us about the M1A1 buy and the Bradleys and the others.

Mr. CHAPPELL. What deficiencies exist in current armored vehicles which you would hope to correct with the new family?

General HARRISON. You start by looking at the threat and the capability of the threat. What we project—now we are looking at the weight of the vehicles themselves. We are looking at new gun technology that is coming in. There are various things that are out in the technology area now that we could fold in.

We are always looking to cut our O&S costs and make equipment cheaper to operate. If you look at combat vehicles as a family, than you can develop components that have as many interchangeable parts as they can have, plus you look at the whole armored system at one time and optimize as best you can..

Mr. CHAPPELL. Are you saying that the deficiencies have to do with the commonality?

General HARRISON. I would say, the deficiency is our inability to meet the projected threat of the 1990, currently, we are working to improve the lethality of our cannon systems or our gun systems for our tanks——

Mr. **Chappell**. So are you saying that if there is a deficiency, it is the range of the tank?

General **Harrison**. Let me try to explain it this way. We have gone from a 105 millimeter cannon—when we started off building M60 tanks in 1960. Now we have progressed to a 120-millimeter gun. You make the gun bigger and you make your armor better and the enemy does the same thing. This goes back and forth and where is the end to all that? I don't know.

Mr. **Chappell**. I am tryng to get kind of a summation of the deficiencies that you are trying to overcome.

Colonel **Holeman**. I don't think the current fleet has a significant deficiency today. We can defeat the threat today; however by 1995, the threat will have changed significantly and we need to change to meet it. So we are preparing for a future deficiency but not for a current deficiency.

Mr. **Chappell**. Are there vehicles that will be replaced by this family that you know of at this point?

General **Harrison**. Yes, we plan to and there are many variants of the total number of vehicles that we are looking at.

I don't recall the exact number.

Mr. **Chappell**. Why don't you provide for the record the kind of vehicles and the number at this point that you intend to replace.

[The information follows:]

The present fielded quantities cannot be translated into the required quantities of Armored Family of Vehicles in the future. The basis of issue may be other than one for one. In fact, the request for proposal for design concepts invites the contractor to combine some of the current vehicle roles. Candidate systems for replacement by the Armored Family of Vehicles are as shown:

| | |
|---|---|
| M113 (including personnel carriers, mortar carriers, cargo carriers, TOW vehicles, command post carriers, fire integration support team vehicles, electronic warfare shelter carriers, and air defense carriers) | 26,871 |
| M2/3 Bradley Fighting Vehicle Systems | 2,192 |
| M1/M1A1 Abrams Tank | 3,167 |
| M88A1 Medium Recovery Vehicle | 2,052 |
| M578 Light Recovery Vehicle | 1,657 |
| M60 Series Tank | 8,887 |
| M109 Series 155mm Self-Propelled Howitzer | 2,240 |
| M992 Field Artillery Ammunition Support Vehicle | 344 |
| AVLB Armored Vehicle Launched Bridge | 624 |
| M728 Combat Engineer Vehicle | 291 |
| M9 Armored Combat Excavator | 14 |
| M551 Armored Reconnaissance Airborne Assault Vehicle | 140 |
| Multiple Launch Rocket System | 241 |

Colonel **Holeman**. It will provide the new tank, the new infantry vehicle, the new artillery system and the new combat supply vehicle.

Mr. **Chappell**. I assume those new systems will replace something.

Colonel **Holeman**. Yes, they will replace the existing systems.

General **Harrison**. I can give you a number on that. Right now we are looking at 30 variants of armored vehicles out there to combine them into a family.

Mr. **Chappell**. Do we have any projection as to what point in time we will be bringing this new family on line?

General **Harrison**. It would be in the 1990s.

Mr. **Chappell.** That is to meet the improvement of the enemy threat, right?

General **Harrison.** Yes, sir, and to upgrade the fleet of vehicles that we have.

Mr. **Chappell.** Are we talking early 1990s, mid-1990s, or the late 1990s?

General **Harrison.** General Sunell is looking at that now. I couldn't tell you because it depends on what technology he is going to grab hold of, but we will keep the Congress informed.

Mr. **Chappell.** The M1 tank production is scheduled to end in fiscal year 1989 and the Bradley Fighting Vehicle will end production in fiscal year 1990.

What will the Army do with these production lines between the time deliveries end and the new family enters production?

Aren't you going to have a gap?

General **Harrison.** That ties into what General Sunell is doing, to look at that and see what we need to do. Do we need to maintain the production line with the current vehicle? Do we need a product improved fleet? That answer must be integrated with the family of armored vehicles; old and new systems must be tied together.

Mr. **Chappell.** Please answer the following questions for the record.

[**Clerk's note.**—Questions submitted for the record and the answers thereto follow:]

**Question.** If the Army elects not to develop and procure the new Family of Armored Vehicles, what alternatives are being considered for the future?

General **Harrison.** The Army must respond to the projected threat. If the Army does not develop the Armored Family of Vehicles, mission deficiencies will be addressed by independently developed systems. The independent development approach is potentially much more expensive than the development of a family of vehicles.

**Question.** How much is the current five year budget for development of the Family of Armored Vehicles? For procurement?

General **Harrison.** The Armored Family of Vehicles is a new program not in the President's Budget. Currently the Army is developing the FY88 budget, which will be the first year of RDTE funding for the Armored Family of Vehicles.

**Question.** How will competition be maintained during production for such a family?

General **Harrison.** The Armored Family of Vehicles acquisition strategy has not yet been developed. Therefore, it is too early to answer the question in any more than a preliminary way. The request for proposal for development of Armored Family of Vehicles concept designs contemplates the award of up to three separate contracts as the result of a competitive solicitation. This is indicative of the Army's desire to use the competitive market place to obtain the best ideas that industry has to offer.

Because of the breadth of the Armored Family of Vehicles, it is anticipated that production must be accomplished at multiple locations. The expected volume offers significant potential for competition.

*Question.* If production of the M1 and the BFV are to be continued, at what rate and at what annual cost?

Answer. This is a very complex question. The answer is tied to the results of the Armored Family of Vehicles Task Force (AFVTF) initiative as well as an assessment of requirements based on changes in the threat. There are several actions ongoing to get to an informed decision regarding our tank fleet. In addition to the AFVTF effort, we have asked TRADOC to review and provide an assessment of what the program quantity should be to include the mix of Abrams and Patton series tanks. They will also recommend changes to the Abrams, if required. AMC is determining costs of various production rate options and at what point one of the tank plants may have to be closed. We are also looking at mobilization requirements for the tank program. I expect these efforts to come together by early summer 1986.

[CLERK'S NOTE.—End of questions submitted for the record.]

## SPARES

Mr. CHAPPELL. I am a little concerned about the spares budget. The spares budget for tracked combat vehicles is $469.8 million. For weapons and other combat vehciles, it is $17.6 million. Last year you projected these amounts to be $696.2 million and $265.9 million respectively.

What accounts for the dramatic reduction in your actual request?

General HARRISON. Sir, the reduction in the spares line, we have looked at that in detail and it is again, I would highlight the Sergeant York termination was included in that.

We had a rescaling of demands which means that we look at what is being used in the field and see how much we need to buy. That caused a certain amount of the reduction and we had the affordability reductions tying back to the over $6 billion reduction that the Army RDA account took.

Mr. CHAPPELL. Does that impact the war reserve?

General HARRISON. Yes, about $100 million.

Mr. CHAPPELL. What does that mean in days?

General HARRISON. I will provide that for the record.

[The information follows:]

This reduction equates to an estimated ——— days of supply in War Reserves. There will be no impact on training as a result of this reduction.

Mr. CHAPPELL. What is the reserve in days now?

General HARRISON. War reserve in this appropriation, sir, I don't have the answer, but I will provide that for the record.

[The information follows:]

The war reserves for the WTCV appropriation are estimated to be ——— days of supply.

Mr. CHAPPELL. Are any of these reductions attributable to procurement reforms in the buying of spares?

General HARRISON. We had several changes from initial to replenishment policy, but I know of none that were a change.

Colonel HOLEMAN. We had a recalculation and part of that resulted in a reduction of $82 million in spares. I am not sure what the precise basis for that recalculation was.

Mr. CHAPPELL. Provide that for the record.

[The information follows:]

The $157.7 million reduction in WTCV is composed of recalculation of requirements, inflation reduction, termination of Sgt. York, decrease in War Reserves funding and anticipation of fiscal year 1987 economies due to Spare Parts Review Initiatives. Devitalization of contracts and competition for example yielded $1.7 million savings on four key fighting system components in fiscal year 1985.

Mr. CHAPPELL. Is there any reduction attributable to the use of different inflation calculation methodology?

General HARRISON. Not to my knowledge, sir, but I will provide that for the record.

[The information follows:]

A reduction of $21.3 million is attributable to the different inflation rates.

## M1 TANK

### BUDGET

Mr. CHAPPELL. For the M1 tank, the budget includes $1,613,600,000 for procurement of 840 M1 tanks. An additional $351.4 million is included in advance procurement for 840 tanks in fiscal year 1988.

The budget back-up material shows $1,673,087,000 and $321.9 million for advance procurement.

Which are the correct figures, and what accounts for the difference?

Colonel HOLEMAN. The correct figures are the latter ones. The reason for that is we had a late change in the cycle we go through where we got all the money put in to increase production to a certain level. They put it all on the regular line.

To make that a proper mix, we had to make the adjustments at a late hour, so the latter number you mention is correct and $321.9 million for advance procurement is correct.

Mr. CHAPPELL. On February 25, 1986, GAO issued a report on an audit of M1 tank budgets from fiscal year 1980 to 1985. The report shows a consistent pattern of substantial overbudgeting for the M1; reprogrammings totalling $595 million have been made in these years with no impact on procurement quantities.

Are you familiar with this report?

General HARRISON. Yes, sir.

Mr. CHAPPELL. Do you disagree with the facts in the report?

Colonel HOLEMAN. No, sir we don't.

Mr. CHAPPELL. The Congress made a reduction of $235.7 million in the fiscal year 1986 budget without changing the quantity.

By how much do you estimate that your 1986 appropriation is still overfunded?

Colonel HOLEMAN. We believe the 1986 appropriation is not overfunded. When you take the impact of Gramm-Rudman, we will probably have some reduction. The exact reduction, we don't know yet.

Mr. CHAPPELL. What caused the overfunding that I mentioned?

General HARRISON. The facts in the GAO report are correct. I mentioned that we had scrubbed the tank program and taken $168 million out of that in the Army and we haven't cut the quantity of tank.

Mr. CHAPPELL. Are you saying you are able to buy them more efficiently?

General HARRISON. Yes, a certain amount of contract efficiencies and a certain amount we have looked at and taken money out where we thought they had projected too much.

Mr. CHAPPELL. Did multiyear buy play a part in that?

Colonel HOLEMAN. Yes, but we saw the same thing GAO saw and took a reduction of $168 million from the 1987 amount projected the '86 budget and adjusted request accordingly in the 1987 in other words, we reduced the 87 request by 10 percent ourselves.

Mr. CHAPPELL. So we can have confidence that your 1987 budget is correct and has taken into account those things which previously had been regarded as overfunded?

General HARRISON. Yes, sir.

Mr. CHAPPELL. GAO noted that the "Army does not record cost estimates using the same cost elements as in the budgets." How can you make accurate budgets if you have a different breakout of the figures for budget execution?

General HARRISON. Sir, a good question, and I think that is something we need to do and work with the M1 tank program to get that corrected. We have that problem and we are going to try to do something about it.

[Additional information follows:]

We are required, by regulation, to keep financial records at much greater detail than the summary cost elements submitted in the budgets. As an example, the M1 Procurement budget has 28 line items. Actual execution of that budget takes several hundred contracts and individual expenditure lines. To compare the original budget submission to actual execution of the budget requires extensive reconciliation, and is sometimes difficult to track. However, we are required to maintain our accounting records in this great detail to insure proper accounting for expenditures and traceability by any future audit. This does not, however, keep us from making accurate budget projections. Budget personnel use actual costs from previous years to project future requirements and the GAO, as well as others, have been provided detailed reconciliations on many occasions.

Mr. CHAPPELL. Are you doing anything at this time?

General HARRISON. Sir, I think the thing that we have done is go into the program, as we mentioned, and took $168 million out of it and that ought to get folks' attention that when they budget, they better pay attention to the line items and how it is done.

## BLOCK II MODIFICATIONS

Mr. CHAPPELL. The total cost of 840 tanks goes from $1,778,500,000 in fiscal year 1986 to $1,943,187,000 in fiscal year 1987.

How do you justify this 9 percent increase when inflation is down and unit costs should be decreasing as a result of the learning curve and multiyear contracts?

Colonel HOLEMAN. Primarily it is an addition of improvements primarily in block 2. Basically, the block 2 amounts added about $140 million from our 1986 840 tanks to the 1987, 840 tanks.

Mr. CHAPPELL. What was added?

Colonel **Holeman**. We added improvements The most significant improvements were block 2, which is a group of improvments that includes the Commander's Independent Thermal Viewer, improved commanders weapon station, a new laser range finder and battlefield management system. That accounted for 37 of the 140.

We have an additional $13 million because we are going to procure a new track. We are going to improve the tank gun. We will improve and put a long gun tube on the M1A1 that will add $23 million

We are also adding the survivability, another $30 million, and test sets that we had to cut short in 1986 for $37 million. That gives us an additional $140 million for our 1987 tanks versus the 840 tanks we bought in 1986.

Mr. **Chappell**. Roughly what is the increase per tank for those improvements?

Colonel **Holeman**. About $200,000 per tank.

Mr. **Chappell**. Please answer the rest of the questions for the record.

[Clerk's note.—Questions, submitted by Mr. Chappell and the answers thereto follow:]

*Question*. The budget includes $6.2 million in fiscal year 1985, $19.9 million in fiscal year 1986, and $57.0 million in fiscal year 1987 for "Block II" improvements. Provide a funding breakout for these improvements, by year.

Answer. The following sheet represents a breakout of the BIP II Production Program by Fiscal Year.

[The table follows:]

ESC & MILLIONS

| | FY85 | | FY86 | | FY87 | | FY88 | | TO COMPLETE | |
|---|---|---|---|---|---|---|---|---|---|---|
| | QTY | TOTAL COST | QTY | TOTAL COST | QTY | TOTAL COST | QTY | TOTAL COST | QTY | TOTAL COST |
| CMDR'S INDEPENDENT THERMAL VIEWER (CITV) & CMDR'S WEAPON STATION (CWS) PRE PROD HOWR | 840 | 4.4 | 840 | 4.5 | 680 | 3.8 | | | | |
| BASIC BIP II PRODUCTION | | | | | | | | | | |
| CITV/CWS | | | | | 160 | 34.5 | 840 | 188.6 | 779 | 181.0 |
| BATTLEFIELD MGMT SYSTEM (BMS) BASIC | | | | | | | | | | |
| BMS READING REF (HR) & POSTING NAVIGATION (PN) SYS | | | | | | | | | | |
| DRIVERS THERMAL VIEWER (DTV) | | | | | | | | | | |
| CO2 LASER RANGEFINDER (CO2 LRF) | | | | | | | 840 | 18.4 | 779 | 17.7 |
| SURVIVABILITY ENHANCEMENTS | | | | | | | | | | |
| BMS (IDENTIFICATION FRIEND OR FOE) | | | | | | | | | 779 | 38.6 |
| SELF CLEANING AIR FILTER (SCAF) | | | 272 | 2.1 | 840 | 6.5 | 840 | 6.8 | 779 | 6.6 |
| SUB TOTAL HDWR | | | | 6.6 | | 44.8 | | 213.8 | | 243.9 |
| NON REC (INIT PROD FAC) | | 1.8 | | 12.9 | | 3.9 | | 1.2 | | |
| SPT COST | | | | .4 | | 8.3 | | 43.3 | | 49.3 |
| TOTAL | | 6.2 | | 19.4 | | 57.0 | | 258.3 | | 293.2 |
| REG PROG | | 6.2 | | 19.3 | | 42.0 | | 163.6 | | 181.7 |
| ADV PROC | | .6 | | 15.0 | | 94.7 | | 111.5 | | |
| TOTAL COST | | 6.8 | | 34.3 | | 136.7 | | 275.1 | | 181.7 |

*Question.* What is the total cost of the Block II Program?

Answer. The total cost of the Block II Program (RDT&E and WTCV for new production) is $803.8M. This excludes modification costs which are addressed in the following question.

*Question.* What improvements will be added to M1 Tanks which have already been procured, when, and at what costs?

Answer. The Block II Improvements will be added to 2330 M1A1 Tanks currently scheduled to be produced before production cut-in of Block II. These improvements are:

Commander's Independent Thermal Viewer (CITV)/Commander's Weapons Station (CWS); Carbon Dioxide Laser Rangefinder; Battlefield Management System (Basic); Position Navigation System; Survivability Enhancement; Driver's Thermal Viewer; Identification Friend or Foe.

The procurement of these improvements are planned to begin in Fiscal Year 1988 with final procurement in Fiscal Year 1992. The total procurement cost of these improvements is estimated to be $918.6 Million. The application of these improvements is scheduled to begin in Fiscal Year 1990 with final application in Fiscal Year 1994. The total application cost is estimated to be $61.7 Million.

[CLERK'S NOTE.—End of questions submitted by Mr. Chappell.]

### PROCUREMENT PLANS

Mr. CHAPPELL. How many tanks did the Army have funded in 1987, that is, in the budget submitted to OSD?

Colonel HOLEMAN. 840.

Mr. CHAPPELL. Let me ask that again. How many tanks did the Army have funded in its fiscal year 1987 budget submission to OSD?

Colonel HOLEMAN. Seven hundred and twenty, sir.

Mr. CHAPPELL. In the fiscal year 1986 appropriation conference report, the conferees approved multiyear procurement for the M1 chassis, but stipulated that the contract may have a basic quantity of no more than 720 tanks per year beyond 1986.

They also said that options for higher quantities may be established.

What profile and options are you negotiating with the contractor?

Colonel HOLEMAN. Sir, a base of 720 as directed and with increases or options to go up to the authorization amount.

Mr. CHAPPELL. What are the milestones for negotiating the multiyear contract?

General HARRISON. This month and because of the various reductions under Gramm-Rudman, they are trying to pull that together in a contract.

[Additional information follows:]

The Army's audit should cost efforts will be completed in the June time frame, negotiations completed by August and contract finalization in September.

Mr. CHAPPELL. What kind of provisions are being made in the contract to accommodate the potential impact of additional Gramm-Rudman-Hollings sequestration?

Colonel HOLEMAN. We have established a base figure from which they will negotiate. That number is 770 and then they will negotiate for as many tanks as they can get beyond that up to the authorized quantity.

Mr. CHAPPELL. The last tank will be procured in 1989 under the present program?

Colonel HOLEMAN. Yes, sir.

Mr. CHAPPELL. What are your plans for facilities after that time? Do you know yet?

Colonel HOLEMAN. No, sir, we do not know yet.

Mr. CHAPPELL. That depends on the report?

Colonel HOLEMAN. General Sunell's report, yes.

Mr. CHAPPELL. What do you consider a minimum sustaining rate for M1 production?

Colonel HOLEMAN. We have two interdependent plants, and it is 600 tanks per year.

Mr. CHAPPELL. How much would it cost to produce at that rate?

Colonel HOLEMAN. Sir, that is the minimum sustaining, we think to go from 720 tanks down to 600 will cost an additional 4 to 6 percent per tank.

[Additional information follows:]

The cost for producing at 600 per year is dependent on a number of factors including whether or not a multiyear procurement could be negotiated, how long the production will continue, and several other factors. The Army estimates that the cost of reducing the production from 720 per year to 600 would add at least 14 percent increase to the cost. The 14 percent is derived from a minimum ten percent from the lost of MYP and four percent from a lower production rate penalty.

Mr. CHAPPELL. What is how much in dollars?

Colonel HOLEMAN. About $100,000.

General HARRISON. Eighty to $100,000.

### DELIVERIES

Mr. CHAPPELL. The first M1A1 tank with a 120-millimeter gun was scheduled to be delivered last August.

Did this take place?

Colonel HOLEMAN. Yes, sir, it did.

Mr. CHAPPELL. It was on time?

Colonel HOLEMAN. Yes, sir.

Mr. CHAPPELL. Late last year there was a strike at the tank plants. How long did that strike last?

Colonel HOLEMAN. From mid September to mid November, and the impact was to cause a delay of approximately three months.

Mr. CHAPPELL. Has the Army negotiated a revised delivery schedule?

General HARRISON. Not yet.

Mr. CHAPPELL. Are you going to?

General HARRISON. We are looking at that, yes, sir.

Mr. CHAPPELL. Please answer the rest of the questions on tank deliveries for the record.

[CLERK'S NOTE.—Questions submitted by Mr. Chappell and the answers thereto follows:]

*Question.* What was the impact of the strike on tank deliveries?

Answer. The strike at General Dynamics Land Systems lasted for two months. As a result of the strike, the contractor had an excusable delay in delivery of approximately 168 tanks as compared to the contractual delivery schedule.

*Question.* Has the Army negotiated a revised delivery schedule? Do you plan to catch up to the original schedule or to stretch out the funded delivery period?

Answer. The extent of excusable delay is being negotiated as part of the contract schedule revision. Production rates are part of these negotiations. These negotiations will lead to a decision on catch up that will have to be a balance between economy and requirements for the tank in the field.

*Question.* Are there delivery problems other than those caused by the strike? If so, please explain.

Answer. There have been delivery problems that cannot be directly attributed to the strike that have caused the delay in delivery of about 27 tanks as of 1 March 1986.

The delivery delays result from three problem areas:

1. There is a fuel access cover plate that separates and protects the crew from the foward fuel cell. A second tier vendor had used an improper process on these access covers causing the welds to crack after they had been welded in place. The cause of the problem has been identified and corrective action taken.

2. Survivability of the crew in the Abrams tank is enhanced by separating the crew from the ammunition storage compartment. This is accomplished by an armor door. Although the production configuration was successfully validated during ballistic tests in May 85, leakage at the door seal was detected during inspection of initial production M1A1 tanks. Engineering changes to ensure positive seal of the door have been tested and are in process of approval and implementation.

3. The main gun on the Abrams tank has a requirement for a field of fire of 10 degrees depression. Initial production M1A1 tanks did not meet this requirement. An analysis done on the initial M1A1 tanks indicates that a depression of 9.5 degrees can be achieved with minor changes to main gun turret components. While the changes are being made to enable a depression of 9.5 degrees, consideration is being given to further modification for the full 10 degrees.

*Question.* For the record, provide the original delivery schedule, by month, for the FY 1984, 1985 and 1986 programs, the actual deliveries, and the current forecast of deliveries.

Answer. The contractual delivery schedule and actual deliveries for FY84 (6th program year), FY85 (7th program year) and FY86 (8th program year) are attached. The Army is currently negotiating with the contractor to get a revised delivery schedule that balances the Army needs and the plant capacities.

[The tables follow:]

## FY84 (6TH PROGRAM YEAR)

| | 1985 | | | | | | | | | | | 1986 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | TOTAL |
| ORIGINAL SCHEDULE | 1 | 74 | 74 | 77 | 70 | 74 | 77 | 70 | 80 | 66 | 56 | 77 | 44 | | | | 840 |
| ACTUAL DELIVERIES | 13 | 74 | 77 | 77 | 70 | 74 | 79 | 65 | 31 | 0 | 0 | 31 | 80 | | | | |

## FY85 (7TH PROGRAM YEAR)

| | 1986 | | | | | | | | | | | 1987 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | TOTAL |
| ORIGINAL SCHEDULE | 26 | 70 | 77 | 74 | 74 | 77 | 74 | 74 | 80 | 63 | 59 | 74 | 18 | | | 840 |

## FY86 (8TH PROGRAM YEAR)

| | 1987 | | | | | | | | | | | 1988 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | TOTAL |
| ORIGINAL SCHEDULE | 52 | 78 | 74 | 70 | 76 | 80 | 74 | 74 | 78 | 66 | 60 | 58 | | | | 840 |

[CLERK'S NOTE.—End of questions submitted by Mr. Chappell.]

### RE-ENGINING THE M1

Mr. CHAPPELL. The Army has steadfastly supported and maintained its decision to power the M1 tank with a turbine engine. We understand, however, that the Tank Automotive Command recently completed a cost analysis titled "Diesel Engine for the M1 Fleet."

Why has the Army had second thoughts about the turbine engine?

General HARRISON. Sir, we haven't had second thoughts about the turbine engine. There are proposals out there from contractors and ideas on how we could improve the tank fleet.

We have not received any of those for formal evaluation yet.

Mr. CHAPPELL. The initiative essentially comes from the contractors or does the initiative for looking at that come from the Army?

General HARRISON. It comes from the contractors to date.

Mr. CHAPPELL. The Tank Automotive Command study, was that triggered by industry or by some thoughts on more efficiency or for some other reason?

Colonel HOLEMAN. One of our concerns with the turbine engine is its high fuel consumption. That is one of the reasons we are buying an auxiliary power unit for it.

We are also looking at alternatives to reduce the fuel consumption. When we looked at various alternatives not so much for this tank family but for the future families, we tried to evaluate whether or not to go to turbine or diesel propulsion. At the same time they said, could we get any significant advantages putting that on the current family of vehicles.

The bottom line was that we could not offset the cost of changing out the engine.

Mr. CHAPPELL. Essentially what is the difference in the fuel consumption, under normal battle conditions, between the two type engines?

Colonel HOLEMAN. I don't know the gallons per mile savings, but the primary savings is that the turbine engine runs at a constant speed and uses a constant amount of fuel, whether it is idling or going 40 miles an hour. The diesel engine uses far less fuel while it is idling and about the same, perhaps a little more, at 40 miles per hour. A turbine consumes far more fuel idling than a diesel.

Mr. CHAPPELL. You could get a good deal more logistical efficiency if you were able to get a more efficient engine?

Colonel HOLEMAN. Yes, sir.

Mr. CHAPPELL. You get essentially the same performance?

Colonel HOLEMAN. When we initially made the decision to go to turbines, we could not get the same performance. It appeared the only way to get the performance was to go to the turbine engine.

Now it seems we can get the same performance from advanced technology diesels. But to help us control those fuel efficiencies we have to use an auxiliary power unit. We expect the addition of an auxiliary power unit, which is in our budget for 1986 and 1987, to save about $15,000 a year on the average tankful.

Mr. CHAPPELL. Per tank?

Colonel HOLEMAN. Yes.

Mr. CHAPPELL. How many are operating now?

Colonel HOLEMAN. Our goal is to have 4,000.

Mr. CHAPPELL. Why does the cost of the gun go from $64.8 million in fiscal year 1986 to $88.2 million in fiscal year 1987, for the same number of tanks?

Colonel HOLEMAN. ———.

Mr. CHAPPELL. Please answer the remaining questions on the M1 tank for the record.

[CLERK'S NOTE.—Questions submitted by Mr. Chappell and the answers thereto follow:]

*Question.* What alternatives were considered by the TACOM study, and what were the conclusions?

Answer. The study addressed a generic modern technology diesel engine with equal performance to the current engine for placement within the full envelope dimensions of the Abrams Tank. Modifications were limited to engine hand-on equipment (cooling, controls, electrical, hydraulic, etc.) grill and fuel tanks.

Study considered the following scenarios in combinations for the 7467 current production tanks:

1. Diesel Engine with modified M1 transmission, or with new transmission.
2. Reliability ratios of 1 to 1, or 2 to 1, or 3 to 1.
3. 20 year vehicle life, or all vehicles phased out in year 2009, or 20 year vehicle life after retrofit.
4. Retrofit 7467 M1/M1A1s with diesel, or retrofit only active fleet of 4,600 M1/M1A1's.

The study also considered a follow-on production of 2500 tanks. However, it did not combine the retrofit alternatives with the follow-on production alternatives.

The study concluded that no scenario with retrofit only produced discounted cost savings. The study also concluded that all scenarios produced discounted cost savings with the follow-on production of 2500 vehicles.

A follow-on study combined the 2500 unit production with the retrofit of current production tanks. All scenarios were considered except transmission was limited to a modified M1 version. Costs for dual support of the fleet were considered. This study concluded that discounted cost savings could be realized in almost all scenarios and undiscounted savings existed in all scenarios. This study did not consider current investment in equipment and material nor were operational readiness aspects evaluated.

*Question.* What plans does the Army have for testing a diesel engine on the M1 tank?

Answer. None at this time. However, the Army is reviewing an unsolicited proposal just submitted by a contractor for evaluating a modern technology diesel. If this proposal indicates positive life cycle cost savings with acceptable operational readiness and sustainability burdens associated with a change to a new engine, plans will be developed for demonstration and test.

## 1987 BUDGET COMPONENTS

*Question.* The budget includes $2M in FY 1985, $1.8M in FY 1986, and $1.88M in FY 1987 for Should Cost. Since the Major M1 components are on multiyear contracts, why are these sums required year after year?

Answer. During FY85 and 86, Should Cost studies were completed or are ongoing for the tank (GDLS), Engine (AVCO), Transmission (DDAD), the LRF/TIS (Hughes), and Line of Sight System (Singer). Should Cost studies are generally required for any noncompetitive, negotiated contracts over $50M. Should Cost studies may be required on the tank of engine in 1987 if multiyears are not awarded. The transmission may also require a new Should Cost in FY87. In addition major programs such as Block Improvements, and Special Projects will be introduced during this time period which will require Should Cost efforts.

*Question.* Describe and justify the $2M in FY86 and FY87 for other projects.

Answer. The initial phase of the Optical Improvement Program (Day Sight) is to be implemented in FY86. The Unit Cost increase will run approximately $2400/unit for 840 tanks or an approximate cost of $2.0M.

*Question.* Why does the cost of track go from $10M per year in FY 85 and FY86 to $23.9M in FY87?

Answer. There is an improved track planned for introduction in FY87 with a replaceable track pad. This track is designed to last longer, offsetting the increased acquisition cost, by significantly reducing operation and support costs.

*Question.* Why does the cost of test sets go from $9M in 1986 to $45.8M in 1987?

Answer. Actual FY86 requirements for test sets are $32.931M. Due to the decrement taken at time of the joint mark, only $9.0M could be funded in FY86, leaving $23.931M unfunded.

Consequently, the unfunded amounts were escalated and added to the FY87 program along with additional unprogrammed requirements bringing total requirements to $70.516M of which $24.681M is unfunded. As FY87 contracts are signed, any resulting savings will be applied to the test set category.

*Question.* Why do government test costs go from $17M in 1986 to $21.3M in 1987?

Answer. Several test requirements changed in the FY87 program. The major ones are:

a. Mine Roller Tests were completed in FY86.

b. Block Improvement Initial Production Tests ($4.0M) are required in FY87.

c. A classified test ($2.7M) is required in FY87.

*Question.* Explain and justify $36.7M for Logistics Contractor.

Answer. This System Technical Support (STS) is for effort devoted to Field Problem Investigation, Alternate Component Analysis, Logistical Support Analysis/Logistical Support Analysis Record (LSA/LSAR), Development of Training, Provisioning and Technical Publications, Modification Work Order (MWO) Preparation, Technical Representative Support, Training, etc. The $36.7M requirement compares favorably with the effort authorized on the latest Abrams Tank Systems STS Contract.

*Question.* Explain and justify auxiliary service for $32.6M.

Answer. This element represents costs associated with the operation of the Detroit Arsenal Tank Plant (DATP) and the Lima

Army Tank Plant (LATP). Included in this element are the cost of facility services, boiler house, utilities and coal as they apply to DATP and LATP. Cost estimates were derived from FY84 actuals with adjustments made for the discontinuanace of funding from the M60 Program as well as inflation.

*Question.* Explain and justify $6.3M for RAM-D.

Answer. The Army is very concerned with operation and support costs and is aggressiviely pursuing all means to reduce those costs. The $6.3M is programed to provide components that are more reliable and durable. Examples of these components are shown below.

### BASIC VEHICLE

Electrical Connector; Modular Electrical; Modular Hydraulics.

### ENGINE

Polygon Drive System; #11 & 12 Conrad Bearings; 5% Cooling High Pressure Nozzle; Alternate Sun Gear Mat'l; Increase Lube Flow—Reduction Gear Box (RGB); Interchangeable Flex Coupling Power Shaft; Improved Durability Combuster System; Recuperator Core; #2 and 3 Bear's Piston Ring Seal; Fuel Pump Drive; #4, 5 & 10 Oil Seals; Fuel Handling Seals.

*Question.* Explain and justify $7.6M for Cost Reduction/Value Engineering.

Answer: This element represents implementation costs associated with approval value engineering changes. Estimates were based on FY85 actuals.

[CLERK'S NOTE.—End of questions submitted by Mr. Chappell.]

Mr. CHAPPELL. Staff would like to ask a question.

Mr. McDade.

### 120MM MORTAR

Mr. McDADE. Thank you, Mr. Chairman.

General, welcome. Let's talk first about the mortar plan you referred to briefly.

The budget includes $13.2 million for procurement of the 120-millimeter mortar. In fiscal year 1986, Congress provided initial procurement funding of $5 million. The Army has spent considerable time developing its acquisition strategy for 120-millimeter mortars.

Summarize the strategy which has finally emerged.

General HARRISON. The strategy for the development—yes, sir. I will be glad to do that.

Mr. McDADE. Procurement.

General HARRISON. Procurement, yes, sir. For 1986, the $5 million shown to procure those weapons, we will not be using if for that purpose. We are not going to procure the tubes with the 1986 dollars.

We will be procuring the tubes for the 9th Division up to the quantity of 145 with the procurement dollars we have in fiscal year 1987. We will be buying ammunition which will be discussed by General Molinelli when he comes to the committee tomorrow, but we will buy the quantities of tubes and ammunition for the 9th Division in accordance with the congressional language that we have received.

We will then look at bringing the production on shore for the tubes and the ammunition.

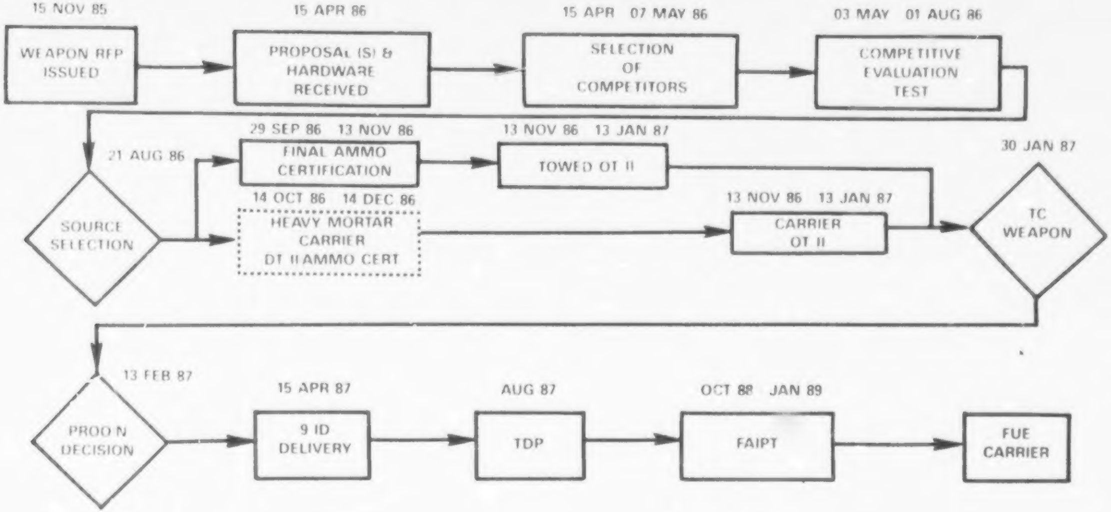
Mr. McDADE. What are the current milestones for this program?

General [illegible]RISON. I would be glad to provide those to you. If I could ha[illegible]ber Vugraph 1; this talks through the entire strategy. I will put that into the record.

[Slide follows:]

## CURRENT BUDGET
## MILESTONE ORIENTED SCHEDULE

# 120MM MORTAR ACQUISITION STRATEGY



15 NOV 85 WEAPON RFP ISSUED

15 APR 86 PROPOSAL (S) & HARDWARE RECEIVED

15 APR 07 MAY 86 SELECTION OF COMPETITORS

03 MAY 01 AUG 86 COMPETITIVE EVALUATION TEST

21 AUG 86 SOURCE SELECTION

29 SEP 86 13 NOV 86 FINAL AMMO CERTIFICATION

13 NOV 86 13 JAN 87 TOWED OT II

14 OCT 86 14 DEC 86 HEAVY MORTAR CARRIER DT II AMMO CERT

13 NOV 86 13 JAN 87 CARRIER OT II

30 JAN 87 TC WEAPON

13 FEB 87 PROD N DECISION

15 APR 87 9 ID DELIVERY

AUG 87 TDP

OCT 88 JAN 89 FAIPT

FUE CARRIER

General **Harrison**. But basically we are competing during this period of time. When we receive the bids from the contractors we will select the competitors. We will do testing. We will have a source selection in August of this year.

While we certify the ammunition, we will do testing. We will plan to type classify the weapon in January of 1987 with a production decision in February of 1987, which would then use the production dollars that we are asking for for the 145 weapons, delivered to the 9th Infantry Division in April of 1987, and then to continue on with the carrier mounted version.

That basically is the strategy for the mortar. We are just going into the selection of those tubes in April.

Mr. **McDade**. Do you see any further delays or anything involved? How tight a schedule are we looking at?

General **Harrison**. We are looking at a tight schedule. I will tell you that we have had the contractors as they are working to meet our bids, there is one request that I am aware of that has been submitted for a delay. That request is being looked at by the Army Materiel Command now, but I have no indication of any other slip there at all, and again that one is just a request from a contractor.

Mr. **McDade**. Will you tell us how many 120s will be procured and what estimated total acquisition cost?

General **Harrison**. Yes, sir. The total procurement quantity is 2,606 quantity and the price of $219.6 million is our forecast. I must tell you that there is a possibility that that number could almost double depending upon which configuration we select, a heavy or a light, and whether one is strapped into the carrier or not.

Mr. **McDade**. The number could double?

General **Harrison**. It could and that has been in our mortar plan. We have stated that that is a possibility, but we don't know because until we see which version is selected, the possibility of a strap in version in a carrier is there. So that number could go as high as 4700 if we do that.

Mr. **McDade**. Do you have a feel yet for the likely competitors in the program at this point?

General **Harrison**. Yes, sir. There are three competitors that I am aware of now, an Israeli firm of Solgad; we have a Spanish firm and a French firm that are supposedly submitting bids and are working with a U.S. teaming partner to do that.

Mr. **McDade**. Let's talk about the Bradley Fighting Vehicle.

General **Harrison**. There may be others. Their bids will be submitted on the 15th.

## BRADLEY FIGHTING VEHICLE

### BUDGET

Mr. **McDade**. The budget includes $1,121,800,000 for procurement of 870 Bradley Fighting Vehicles. An additional $20.6 million is included for advance procurement for 870 vehicles in fiscal year 1988. How much funding, and for how many vehicles, was included in the Army's budget submission to the Office of the Secretary of Defense?

General **Harrison**. Sir, 600 was in the original submit to the Secretary of Defense's office. I do not have the procurement dollars associated with that, but I will provide that for the record.

[The information follows:]

The budget submission to the Office of the Secretary of Defense projected a buy of 600 vehicles for $794.5 million.

Mr. **McDade**. Can you tell us why the OSD increased the procurement quantities?

General **Harrison**. OSD also increased the procurement quantity for the tank from 720 to 870. This goes from 720 up to 870 in an effort to modernize our forces as quickly as we can.

As the Army went through that working within the dollar constraints that we had, we funded it at the 720 level. The Secretary of Defense looked at that and decided they would like for us to go for 870 and the funds were given to do that.

Mr. **McDade**. Your are saying it is a strategy that the tank and the vehicle go together as part of a family?

General **Harrison**. You could look at it like that. The key thing is to be sure that units having M1s are paired with units having Bradleys.

Mr. **McDade**. Are there savings associated with the increase?

General **Harrison**. Yes, sir. When you produce more, you get cost savings, about 4 percent per vehicle.

Mr. **McDade**. The split between advanced procurement and regular procurement is different in the P-1 than in the budget back-up material for fiscal year 1986.

Which is correct, and what accounts for the difference?

General **Harrison**. The budget backup is correct. As mentioned earlier, on the tank we could not get all the administration corrected before the forms came in.

Mr. **McDade**. Are we likely to see a reprogramming to effect these changes?

General **Harrison**. No, sir, we do not plan one.

Mr. **McDade**. That is 1986 money I am talking about. Take a look at it and give us an answer for the record.

[The information follows:]

The P-1 document is in error. The total obligation authority for Bradley is correct at $933.5 million. However, when the money was split up to the regular and advanced procurement lines, an error occurred. The Congressional authorization position of $27.6 million instead of the Congressional appropriation position of $22.3 million was entered into the computer. Since the sum of regular and advance procurement must be $933.5 million, the error automatically propagated to the regular procurement budget line. The P-1 document for the regular line reads $905.9 million but it should read $911.2 million. The error was discovered after data base lock for the P-1 document but prior to submission of budget backup materials. Subordinate commands were instructed to submit back-up materials which reflect the correct (Appropriated) position for FY86. Since the Army is executing the appropriated position for FY86, no reprogramming documents will be submitted.

Mr. **McDade**. Last year Congress reduced the Bradley budget request by $81.3 million without changing the quantity. Gramm-Rudman-Hollings took an additional $44.6 million in fiscal year 1986.

What impact will this have on the number of vehicles to be procured?

General HARRISON. Sir, we are trying to hold it at 716 for fiscal year 1986 and if we can do that and not cut any vehicles, that is our goal. There have been cuts taken out of the program, but we are trying to maintain that quantity.

Mr. McDADE. Amounts somewhat similar to this have been found in prior years and even after a reduction is made here, there seem to be large excess balances which get reprogrammed.

Is this another account where there is a constant overbudget for the Bradley program? What accounts for this, General?

General HARRISON. Sir, an honest answer is that there are a couple of programs that we are responsible for right now that I will tell you that we are taking a close look at how they budget, and you hit it on the head when you said that we have reduced dollars, but we haven't reduced quantities.

Something has to come out of that program and you are either stripping the guts out of the bottom of it so you maintain quantity or you have funds in there that are overbudgeted.

I will tell you in the case of the Bradley and the tank that we are going to be vulnerability testing of the two systems and cutting in Mods as quickly as we can and that is going to chew up some of the funds in the programs. We made significant cuts in those and I feel we are getting them down but I sure want to budget better in the Bradley and the tank.

Mr. McDADE. We want to work with you to do that.

The fiscal year 1987 advance procurement budget requirement was forecasted last year to be $66.7 million, but the actual budget has $20.6 million. Your can see the reasons for our concern.

General HARRISON. And I share those.

Mr. McDADE. You are going to get into this account and see that it is budgeted more closely?

General HARRISON. Yes, we are. We already took $50 million out of that on our own when we scrubbed this account based on what they asked for and what we ended up with, so we are doing that internally.

Mr. McDADE. Please answer the following questions for the record.

[CLERK'S NOTE.—Questions submitted for the record and the answers thereto follow:]

QUESTION. What efforts are you making to improve Bradley budgeting?

General HARRISON. Several important efforts are taking place to improve Bradley budgeting. Foremost of which is our ability to increasingly rely on good, mature historical Bradley contract cost data. The system has reached a point, where except for significant changes in the contracting approach or major technical improvements, the historical data helps us create much improved budget estimates. Of course, if we were to change contractors or subcontractors or enter into multiyear procurement with one or more of the existing contractors that would disrupt the historical pattern. The same would also be true for the purchase of significantly different improvements such as the survivability improvements we are buying in FY87. Regardless of these changes, we do expect to see improvements in the Bradley budgeting. Additionally, DA has increased its cost scrutiny of all major programs, including Bradley, Abrams and others.

QUESTION. What are you doing to more closely align the budget categories used in budget formulation with execution?

General HARRISON. The budget and execution categories are aligned in a one-to-one basis on the items of major cost, (e.g. transmission is a budget and contract item). The major exception is the fire control category in which there are two contracts but only one budget item. The reason is that we plan a multiyear contract for the power control unit which is a common module with the tank. This item, which is only approximately five percent of the fire control budget estimate, is contracted through the tank procurement system. It's cost is not sufficient to justify a separate budget item. Many of the smaller cost items which are government furnished equipment to the prime contractor are also grouped together. The cost of these items (e.g. radios) is well established and we do not plan to split them out to individual items. The only other budget category that differs from execution is peculiar support equipment. Execution of this budget item is in five categories, the total cost is not sufficient to justify a split up of this category and we do not plan to do it.

[CLERK'S NOTE.—End of questions submitted for the record.]

PROCUREMENT STRATEGY

Mr. McDADE. Keep the committee posted.

Last year the committee approved a second multiyear procurement contract for the transmission. It now appears that this has been abandoned.

Can you tell us why and what the current procurement strategy is?

General HARRISON. Yes, sir. The Army Materiel Command abandoned that because of some instability in the program, because of the economics of the proposal weren't right. They weren't showing the savings we'd expected and the savings weren't in the right areas. Also there were doubts about stability of program due to this survivability.

We want to use multiyears when we have got a good stable product, and right now we felt like we didn't have it.

Mr. McDADE. The committee also encouraged a second-source procurement strategy for the integrated sight unit. What are the Army's plans in this regard, and the current milestones?

General HARRISON. We are following that and we encourage that also, and we are going out to compete the second source for the ISU. It has been a limiting factor in our production and we are going to compete it. It is being done now. I do not have the date when we will release that competitive document, but it is in the process right now.

Mr. McDADE. The turret drive is being procured under a multiyear contract which ends in fiscal year 1987. What is the procurement strategy beyond fiscal year 1987?

General HARRISON. Sir, we are looking at competing that also.

If we decide to stay with the multiyear strategy that we have, we will have to reprogram below threshold and we can do that, but right now we will do the reprogramming for the economic order quantity if in fact that is what we decide to do.

Mr. **McDade**. Did you say you were going to go for a second source on the transmission for the Bradley Fighting Vehicle?

General **Harrison**. We are going to compete it but when it is stabilized——

Mr. **McDade**. So your procurement plan is to stabilize——

General **Harrison**. The design and quantity and then compete.

Mr. **McDade**. And then at that point, compete it and perhaps go to multiple sources; have you decided that yet?

Colonel **Holeman**. I think not. I think we will compete it and there will be one winner and we either go with one winner with a single year and options or one winner with a multiyear.

I don't think we will have two producers.

### BRADLEY SURVIVABILITY IMPROVEMENTS

Mr. **McDade**. Survivability has been a big issue with respect to the fighting vehicle. Let me ask you first what specific survivability improvements is the Army planning for the Bradley as a result of the livefire tests?

General **Harrison**. A good question. Let me take a look at that. We have a chart.

[Slide follows:]

# PHASE II TESTING
# EVALUATES

- IMPROVED ARMOR (INCLUDING OVER MATCHING ROUNDS)
- SPALL LINERS
- IMPROVED FUEL SYSTEM
- IMPROVED FIRE SUPPRESSION SYSTEM
- ARMORED PERISCOPE COVERS
  - 25MM AMMUNITION COMPARTMENTS
  - PERSONNEL HAZARDS (TOXIC GASES, FLASH BLINDNESS, ETC)
  - REPEAT PHASE I SHOTS — WHERE CHANGES COULD ALTER DATA
    - PHASE I 68 SHOTS INCL 10 FULL UP ([illegible] VEH)
    - PHASE II UP TO 52 SHOTS INCL 34 FULL UP (2 VEH)
    - ALL FULL UP SHOTS — DYNAMIC FIRING

*PHASE II OUTLINE TEST PLAN SUBMITTED TO OSD ON 18 FEB 86*

General **Harrison**. What we are specifically looking at, sir, we are starting testing this month in Phase II. We are looking at improving the armor on the system by hanging more armor on the Bradley, and by putting spall liners that I discussed before on the inside that will cut down on casualties inside the vehicle.

Mr. **Chappell**. What is a spall liner?

General **Harrison**. It is a liner inside the vehicle. When you get penetrated by a high explosive anti-tank round, it puts a jet into the vehicle. You have a stream that goes inside and it will break off pieces of the inside of the vehicle that becomes fragments. Then you have this cone effect that comes out inside the vehicle that is a serious casualty producer, and so if you can put something in there, for example, Kevar, such that when the fragments go out inside they are stopped by the liner, it is a simple process and it improves the survivability of the soldiers.

It is a fairly easy thing to do. We are doing that in a lot of vehicles now. On the M113 series, we are doing that.

The vulnerability tests have been good to show us how can we save soldiers' lives. We have a fire suppression system that when the fire starts instantaneously, the system puts the fire out. Fuel fires only; it will not put out propellent fires. We are draining the fuel differently so that we drain it out of the top tank where it is more vulnerable and we operate off the lower fuel tank.

We are putting periscope covers on our periscopes so they won't be damaged, and we are recompartmenting the fuel. We will shoot those again and see what the improvement is and where we need to go, but we feel certain that with spall liners and with armor, that we are going to really cut down the vulnerability of that weapon systems. That is the next phase; we start that this month, and can submit a report to the Congress in June.

Mr. **Chappell**. You are not able to tell us at this point the testing done on each improvement and what result——

General **Harrison**. We are going to put those in and start shooting them this month, and I will be able to come back and tell you that these improvements made this difference, but what I can tell you now is that those spall liners make a tremendous difference; when that cuts down the casualties by 70 or 50 percent, they are going to make a big difference.

[Additional information follows:]

A development program for reactive armor has been ongoing for a number of years. The concept was demonstrated in Sept. 85. The reactive armor for Bradley has been undergoing successful testing since that time. Spall liners and passive armor development have been proven in other programs such as M113.

Prototype qualification testing of four survivable Bradleys will be conducted at Aberdeen Proving Ground (APG), starting in September 1986, and will run thru May 1987. These tests are to measure vehicle and subsystem performance and reliability. A live fire test will be conducted at APG against high survivable Bradleys starting 20 March 1986 and concluding in May 1986.

Mr. **Chappell**. Can we retrofit the spall liners?

General **Harrison**. Yes.

Mr. **Chappell**. General, I think this probably is going to be an issue even on the floor, so I would like you to describe your own confidence and the Army's confidence in the survivability of the Bradley Fighting Vehicle.

General HARRISON. I would be glad to do that.

[Slide follows:]

# WHAT WE LEARNED

- JET IMPACT ON AMMUNITION MAJOR HAZARD TO VEHICLE AND CREW
- AUTOMATIC FIRE SUPPRESSION SYSTEM EFFECTIVE IN EXTINGUISHING FUEL FIRES
- LITTLE EFFECT ON VEHICLE OR CREW DUE TO OVERPRESSURE AND TEMPERATURE (VAPORIFIC EFFECT)
- PREVENTION OF PENETRATION AND SPALL WILL REDUCE VEHICLE DAMAGE AND CASUALTIES
- SPALL HAS MINIMAL EFFECT ON AMMUNITION DUE TO AMMUNITION PACKAGING
- SECONDARY FIRES UNLIKELY

SURVIVABILITY CAN BE IMPROVED

General **Harrison**. The survivability ties into what we learned and then I will tell you how I feel about this vehicle.

We learned from this that that jet about the antitank round when it comes in there, it causes a major hazard to the vehicle and crew. Spall, if spall hits the crew, they will be injured. If that jet hits ammunition in specific places, it is going to blow up.

The fire suppression system was very effective in putting out the fuel fires. We fired against the BMP, which is the Soviet carrier, and what we found is that they are going to lose a lot of BMPs to fires. Our vehicle has it; it has paid off. It is an instantaneous turn-on of Haylon that puts out the fire. The pressure and temperature inside when the vehicle is hit are not significant casualty producers, you may have heard some people talking about vaporifics; that you get a fireball. You do not. Some say you get high pressures that cause damage to soldiers—you do not. The hatch covers open and immediately ventilate the vehicle relieving any overpressure.

On this issue there has been discussion between us and the Secretary of Defense on that item of how you count casualties. So that this year, the Army does not count as a casualty a soldier that has a ruptured eardrum. When you are in the vehicle and a round comes in, you are going to feel it in your ears. But a man can fight if he has to with a ruptered eardrum. The fellow sitting behind me has had ruptered eardrums and vehicles blown out from under him in Viet Nam. He continued to fight.

We want to stop the round from getting in and therefore the applique armor, reactive armor, and we want to put the spall liners in to reduce the casualties.

Tests are showing that secondary fires are not a problem.

Mr. **Chappell**. Describe the additional armor.

General **Harrison**. ———

Mr. **Chappell**. Is a jet a fireball situation?

General **Harrison**. Like a little stream of explosive, sir. It is a hot jet that goes right inside. When you get a penetration against an armored vehicle, that jet, which is called a shape charge, drives it right into the vehicle and you may have a small hole and it is like a cutting torch going inside.

When it hits it, it could cause damage. So what we have here on suvivability, we have got a system out there that isn't a tank, not just a personnel carrier, it is a fighting vehicle. It does have vulnerabilities. But we have made it a survivable as we can by those kinds of things that you see there.

What I haven't talked about is the thermal sights that give ability to see at night and look through smoke. The Bradley has that. We have had good reports from the National Training Center that that night capability has made a tremendous difference there.

[Slide follows.]

# BRADLEY FIGHTING VEHICLE

BRADLEY IS
NOT
A TANK...

NOR MERELY
A PERSONNEL
CARRIER

**BRADLEY:**

- IS VULNERABLE AS ARE ALL SEA, AIR AND LANDSHIPS
- HAS THE KEYS TO SURVIVAL ON THE LETHAL BATTLEFIELD, NAMELY

  ATGM TANK KILLING CAPABILITY
  OUTRANGE TANK CANNONS
  FIRES FROM DEFILADE
  THERMAL SIGHTS - NIGHT/SMOKE
  IMPROVED ARMOR VS M113
  STABILIZED GUNS
  AGILITY AND SPEED
  FIRING PORT WEAPONS
  SMOKE GENERATOR AND GRENADE LAUNCHERS

- WILL SURVIVE WHEN USED BY TACTICALLY COMPETENT LEADERS AND WELL TRAINED SOLDIERS

General **Harrison**. The bottom line is what I have been talking to you about, train leaders, that is us; we will train soldiers, the key to employment. So I guess, let me just tell you about the survivability of this vehicle.

It is very suvivable. We are putting our soldiers in it. I have no qualms about doing that and sending them into war in a vehicle we have today, but we know how to make it better and we need to do that through these survivability improvements like we have on other systems. Block improvements, retrofit if necessary, but the soldiers need it and they like it.

Mr. **McDade**. How much is included in the fiscal year 1987 budget for these improvements that we are talking about?

General **Harrison**. Per vehicle, we have budgeted $81,000.

Mr. **McDade**. Our figure that we have developed is 78; yours is 81.

Tell us what the basis of that $81,000 is, please. What is in the estimate?

General **Harrison**. The estimate includes what we feel is our best estimate to put those things on the vehicle in fiscal year 1987.

Mr. **McDade**. Is there any cap on the improvement costs? Is there a point where you are going to say we are not going to pay any more for improvements in the vehicle?

General **Harrison**. When you are talking about the tradeoff of soldiers' lives, I can't give you a number. I would have to say how much is it going to cost and how affordable is it and what difference does it make and this will tell us. We are looking at $81,000 per vehicle as our best estimate.

Colonel **Holeman**. Nothing will be put on unless it proves effective. We are thinking that the cap is going to be around 75 to 80. We don't know exactly what it will be until we test it and find out what is effective.

Mr. **McDade**. You are not sure on what improvements you are going to put in? We are talking about half a billion dollars here for this kind of program, and what we don't know and what we don't have before us is exactly what is going to make up that $75 or $80,000 per vehicle.

General **Harrison**. I think you have in front of you those improvements that I showed on the armor and the spall and the fire suppression.

Mr. **McDade**. They are all agreed upon?

General **Harrison**. We feel certain we are going to put that in but we have to test it. I may say that spall liners give me 40 percent, maybe it turns out to be 50 or 30, but is is going to make a big difference as is reactive armor, but we have to test it and see.

We think we have a pretty good handle on that, but we are going to test it to make sure. But I would say those three improvements are going to go on there unless something drastic happens that changes that.

Mr. **McDade**. What is the total cost of these vehicles in fiscal year 1987 and beyond?

Furnish that for the record.

[The information follows:]

We have budgeted $81 thousand dollars per vehicle in the FY87 budget. This totals to $70.5 million in FY87 and approximately $260 million throughout the remainder of the program. We have not yet decided whether or not to retrofit these improvements to the fleet already produced. The unit cost, funding profile, and total cost of such a retrofit is not yet known. The acquisition strategy for the improvements to be cut into the production line beginning in FY87 has been decided. We plan to competitively procure the external armor packages. The internal spall liners will be procured through the prime contractor. We are encouraging competition at the subcontractor level. Since no retrofit decision has been made for the fleet already procured, no acquisition strategy for retrofit improvements exists.

Mr. **McDade**. How many of the previously funded vehicles will receive these improvements and what is the funding profile and total cost for doing that?

General **Harrison**. We are going to have to look at the retrofit version where they are in the world and determine whether we retrofit the whole fleet or what portion of it. It becomes a question of affordability and where the most critical need is.

Mr. **McDade**. When are you going to make that judgment?

General **Harrison**. After the June test, sir, the one being conducted now that will be completed and reported in June. A DA (Dept of Army) IPR (in process review) is currently scheduled for March 1987.

### ACQUISITION STRATEGY FOR SURVIVABILITY IMPROVEMENTS

Mr. **McDade**. Do you have an acquisition strategy for these improvements? What is it?

General **Harrison**. Yes, sir, we have a strategy. These fixes that we are projecting right now we will start cutting in in the fiscal year 1987 production. We will see them come off the line in fiscal year 1988.

Mr. **McDade**. What about the purchase of them? What is your procurement strategy on purchasing the unit?

General **Harrison**. The reactive armor will be competed. The spall liners will be installed by the prime contractor and we are encouraging competition at the subcontractor level.

### INTEGRATED SIGHT UNIT DELIVERY PROBLEMS

Mr. **McDade**. As we understand it, there is delivery problems with the sight unit. Can you tell us the cause of the problems?

General **Harrison**. The cause of the problem is with the manufacturer. We have had extensive looks at Hughes to determine the nature of the problem. All of that folds into the decision to compete it, which is a real good equalizer when people are having problems, you get somebody else that can do it.

Mr. **McDade**. Are you doing that now?

General **Harrison**. Yes, we are going to compete the ISU between Hughes and whoever comes into the market.

Mr. **McDade**. How many units is the contractor now behind the original and revised delivery schedules?

General **Harrison**. About 100.

Mr. **McDade**. If you need to determine it for the record——

General **Harrison**. We will.

[The information follows:]

The contractor is 31 ISUs behind the original and revised delivery scheule for the 1984 contract as of end of February, 1986. Completion is expected by April, 1986.

Mr. McDade. When do you expect to be able to have deliveries of ISUs in accordance with contract requirements with FMC?

[The information follows:]

The HAC FY 84 contract was scheduled for completion in Feb. 85. Hughes completed deliveries from this contract in Apr. 86. FY 85 contract includes delivery of both basic TOW ISU and TOW2 ISU. Based on the Hughes, FY 85 contract delivery schedule, a 60 day inventory which is required by FMC contract, will be achieved in May 1986, for TOW2 ISU and Aug. 86 for basic TOW ISU.

Mr. McDade. What is the impact of the late deliveries on the Bradley production?

General Harrison. The impact is that when you don't have enough there, you have to leave a hole on the line and you will have some parked outside and you try to keep those numbers down as much as you can. The total number now, there are 90 that are in storage, 90 Bradleys that are now in storage not just for the ISU, because there are problems with the launcher and the command guidance unit, and that are funished by the same contractor.

We tried to keep the number down in storage. We rotate them. The program manager is trying to keep them going out into the field and not leaving them sit too long. But it has caused us a problem, because they are not able to deliver and we are not happy with that.

Mr. McDade. Since the ISU is government-furnished equipment, what financial liability does the Army face with FMC as a result of late GFE?

General Harrison. I don't know the answer to that, sir. I will provide it for the record.

I would like to clarify on the number of ISUs. Right now we have 31 short of the revised contract schedule, 31. The original schedule you asked—I will provide that for the record on the original.

[The information follows:]

The Army is facing a potential financial liability in excess of $450 thousand resulting from late ISU deliveries. However, negotiations are being conducted which would result in direct reimbursement to FMC by Hughes Aircraft Corporation (HAC), eliminating any government financial liability. This arrangement has been accepted by FMC and HAC and is currently being staffed within the Army for final approval.

Mr. McDade. Given these delivery problems that you have had, how do you expect to be able to ramp up Bradley production from 600 in fiscal year 1984 to 655 in 1985, 716 in 1986, and 870 in 1987?

How are you going to meet that schedule?

General Harrison. It will help if we can get the Hughes situation under control so that we can get the ISUs out. They have been producing better in the last several months. We intend to push to meet that schedule and I know of nothing right now that would stop us from doing that by fiscal year 1987.

Mr. McDade. It is a pretty steep ramp-up?

General Harrison. Yes, sir, it is steep. They have been producing these for a while. We hope they get their problem solved, but also right behind them is a second source that is going to make things better, has to.

## DELIVERY SCHEDULE OF ISU/BFV

Mr. **McDade**. Provide for the record the required, actual and projected monthly deliveries of the ISU and the Bradley for the Fiscal Year 1984, 1985, and 1986 funded delivery period.

[The information follows:]

The following charts show vehicle and ISU deliveries.

### FY 84 FUNDED DELIVERY PERIOD

| Month | Vehicle | | | ISU | | |
|---|---|---|---|---|---|---|
| | Req | Act | Proj | Req | Act | Proj |
| Feb 85 | | N/A | | 60 | 61 | |
| Mar 85 | | N/A | | 65 | 70 | |
| Apr 85 | | N/A | | 69 | 28 | |
| May 85 | 41 | 41 | | 71 | 74 | |
| Jun 85 | 68 | 68 | | 69 | 47 | |
| Jul 85 | 37 | 37 | | 71 | 68 | |
| Aug 85 | 39 | 41 | | 75 | 25 | |
| Sep 85 | 51 | 52 | | 64 | 63 | |
| Oct 85 | 60 | 59 | | 79 | 67 | |
| Nov 85 | 47 | 47 | | 56 | 40 | |
| Dec 85 | 42 | 42 | | 50 | 50 | |
| Jan 86 | 57 | 56 | | 50 | 72 | |
| Feb 86 | 49 | 49 | | 0 | 69 | |
| Mar 86 | 52 | | 52 | 0 | | 31 |
| Apr 86 | 57 | | 57 | | | |

### FY 85 FUNDED DELIVERY PERIOD

| | Vehicle | | ISU basic | | ISU-T2SS | |
|---|---|---|---|---|---|---|
| | Req | Proj | Req | Proj | Req | Proj |
| Feb 86 | | | | | 2 | [1] 2 |
| Mar 86 | | | 20 | 20 | 5 | 5 |
| Apr 86 | | | 54 | 54 | 6 | 6 |
| May 86 | 54 | 54 | 52 | 52 | 8 | 8 |
| Jun 86 | 59 | 59 | 53 | 53 | 10 | 10 |
| Jul 86 | 35 | 35 | 51 | 51 | 12 | 12 |
| Aug 86 | 42 | 42 | 40 | 40 | 23 | 23 |
| Sep 86 | 58 | 58 | 36 | 36 | 26 | 26 |
| Oct 86 | 60 | 60 | 35 | 35 | 33 | 33 |
| Nov 86 | 56 | 56 | 14 | 14 | 44 | 44 |
| Dec 86 | 48 | 48 | | | 5 | 55 |
| Jan 87 | 60 | 60 | | | 65 | 65 |
| Feb 87 | 60 | 60 | | | 44 | 44 |
| Mar 87 | 60 | 60 | | | 12 | 12 |
| Apr 87 | 57 | 57 | | | | |

[1] Actual

### FY86 FUNDED DELIVERY PERIOD

| Month | Vehicle | | ISU-T2SS [1] | |
|---|---|---|---|---|
| | Req | Proj | Req | Proj |
| Feb 87 | | | | |
| Mar 87 | | | | |
| Apr 87 | | | | |
| May 87 | 62 | 62 | | |

FY86 FUNDED DELIVERY PERIOD—Continued

| Month | Vehicle Req | Vehicle Pro | [illegible] Req | [illegible] Pro |
|---|---|---|---|---|
| Jun 87 | 68 | 68 | | |
| Jul 87 | 53 | 53 | | |
| Aug 87 | 34 | 34 | | |
| Sep 87 | 65 | 65 | | |
| Oct 87 | 68 | 68 | | |
| Nov 87 | 56 | 56 | | |
| Dec 87 | 53 | 53 | | |
| Jan 88 | 57 | 57 | | |
| Feb 88 | 62 | 62 | | |
| Mar 88 | 71 | 71 | | |
| Apr 88 | 67 | 67 | | |

Schedule not yet [illegible] but will support the vehicle [illegible] requirement.

## M119 105MM TOWED HOWITZER

Mr. **McDade.** The budget includes $26.5 million for the initial procurement of the M119 105-millimeter towed howitzer. This weapon was developed and is produced by the Royal Ordnance Factories in Great Britain.

Why does the Army need to buy another howitzer?

General **Harrison.** Yes, sir. For the light divisions, the current M102 howitzer has been around a while. It is a work horse, but the reliability and maintainability is not as high as we would like it to be.

We looked at the cost and schedule of totally improving the M102 and it is more advantageous to the government to buy the M119. It has growth potential to allow us a range of 14½ to 19½ kilometers with the new system.

Mr. **McDade.** Can you tell us why this wasn't forecast in last year's budget?

It is a totally new program, isn't it?

General **Harrison.** This is the first year of procurement, yes, sir.

Mr. **McDade.** It wasn't forecast last year. Can you tell us why it wasn't?

General **Harrison.** I don't know the answer to that. Non-developmental item procuring off shore. I can't answer why it was not forecast last year.

I will for the record.

[The information follows:]

Since the M119 was a Non Developmental Item, a decision was made not to commit to procurement until the Army could test and verify that the howitzer met Army requirements. Test data and results would not have been available until the middle of 1QFY86, so the M119 was not forecast in last year's budget.

Mr. **McDade.** What testing has been done on the howitzer?

General **Harrison.** We have tested the howitzer in the 7th and 9th Divisions and it has gone through. I don't know the exact test criteria, but it did meet those that were established in the requirement. I don't have the specific dates on the testing, but I will provide that for the record.

[The information follows:]

UK test data, plus Falklands War data, proved useful to satisfy many US test requirements. The US conducted additional Developmental Testing to determine airmobile and airborne suitability, HMMWV towing compatibility, cold weather capability, reliability, cannon fatigue, and ballistic table testing. Another important test was the firing of the M200 Super Charge, which provides the additional range for this system. A full Operational Test II was also conducted to ensure that all operational requirements were met.

The cold weather testing was done January-February 1985. The other developmental testing was completed from January through June 1985. The Operational Test was conducted at Fort Lewis, Washington July and August 1985. The following testing was done: Cannon Fatigue, Firing Tables, Environmental Chamber, Blast Overpressure, Chronograph Evaluation, Tube Heating/Cookoff, Mobility/Transportation-Cold Weather, Emplacement/Displacement-Cold Weather, Fire Control-Cold Weather, Low Velocity Air Drop, Low Altitude Parachute Extraction System, Internal Air Transportability, External Air Transportability, High Mobility Multipurpose Wheeled Vehicle Towing Test, Rail Impact Test, Mission Performance, Survivability/Vulnerability, Logistic Supportability, Reliability, Availability, Maintainability, Organizational Concept, Doctrinal Concept, Cooperative Fire Support Systems.

Mr. **McDade**. When was the unit type classified and approved for service use?

General **Harrison**. December 1985.

Mr. **McDade**. How long did it take to type classify it?

General **Harrison**. Sir, I don't know how long it took.

Mr. **McDade**. Put that in the record.

[The information follows:]

The L119 British Light Gun was approved for Type Classification Standard as the M119 105mm howitzer and ready for procurement on 19 December 1985.

Mr. **McDade**. What is the total cost of the program for research and procurement?

General **Harrison**. The total cost for research is $15.5 million. The total cost for procurement is $163.7 million for 542 systems.

Mr. **McDade**. Are you going to have to develop a new ammunition for the weapon?

General **Harrison**. We do not have to. We are developing an improved ammunition for a dual purpose ICM for better lethality. We are developing a rocket assisted ammunition taking it to 19½ kilometers for increased range.

Mr. **McDade**. What does it cost for the improvements?

General **Harrison**. I don't have the cost of that.

[The information follows:]

The enhanced 105mm ammunition under development is for all 105mm Howitzers. In addition with the use of a M-200 Super Charge Propellant, which can be used in the M119 gun, this enhanced ammunition can attain greater ranges.

The new ammunition items under development are the XM 913 Rocket Assisted Projectile (RAP) Cartridges and the XM915 Dual Purpose Improved Conventional Munitions Cartridges.

Total cost of new ammo being developed for M119 is as follows:

[In millions of dollars]

| | XM913 RAP | XM915 DPICM |
|---|---|---|
| R&D Costs (Current $FY 86-89) | 13.6 | 25.8 |
| Facilitization costs (Current $FY 89) | 0 | 25.0 |
| Production (PAA) Costs (Current $) | [1] 100.1 | [2] 797.9 |

[1] Starts FY 88

[2] Starts FY 90

Note.—Production costs reflect amount necessary to procure a sufficient quantity to meet DoD Defense Guidance.

**Mr. McDade.** What is the procurement strategy and what are your plans for introducing on-shore production?

**General Harrison.** We are initially, the first 100 must be purchased from the United Kingdom as well as carriages; we are required to purchase 75 carriages and 25 trial assemblies. That is the contract.

Then we start introducing it on shore and we start coproduction between us and the United Kingdom and I can tell you when that will be. We start the coproduction in—with 1987, 1988 and 1989, and then we actually, the U.S. howitzers start coming in fiscal year 1990, which would mean in fiscal year 1989.

So we transition on shore, first U.K., coproduction, transition on shore.

**Mr. McDade.** How many 105-millimeter howitzers are in the Army inventory and where are they deployed?

**General Harrison.** I will provide that for the record.

[The information follows:]

There are 1085 105mm howitzers in the Army inventory that are deployed in the Light Forces which include airborne, air assault, Light Infantry Divisions, and separate Light Infantry Brigades in active and reserve components.

**Mr. McDade.** Tell us why the current howitzers have to be replaced and on what basis.

**General Harrison.** They need to be replaced to provide improved capability to the light divisions and improved reliability and maintainability of the fleet we have now.

The units they will go to are the 7th Division and the 82nd Airborne Division, and we have a fielding plan.

[Additional information follows:]

The M119 Howitzer provides the increased range, lethality and RAM our light forces require. What is needed now is the capability to range further than the enemy. This will provide increased survivability, decrease the need to displace for massing fires and increase capability to suppress enemy air defense. Additonally, the scout helicopters and remotely piloted vehicles proposed for the light divisions will acquire targets to ranges exceeding 20 km, which further supports the need to increase range. Compared to the M102's range of 11.5 km, the M119 fires conventional HE to 14.3 km and the Rocket Assisted Projectile (RAP), currently under development, will extend the range to 19.5 km.

With increased lethality, fewer rounds will be required to defeat the target, thus lessening the logistic burden so crucial to the light divisions. The Dual Purpose Improved Conventional Munition (DPICM) under development will fire up to 14.3 km and will give the division a greater capability against such targets as enemy artillery and light armored vehicles.

The M119 Howitzer would displace all M102 Howitzers, one for one, in the active forces TOE units and one division and six battalions in the Reserve component force with a minimum number of howitzers in the training/testing base.

**Mr. McDade.** What is the authorized acquisition objective and initial issue quantity for this howitzer?

**General Harrison.** The objective is 542.

**Mr. McDade.** Is that how many you actually plan to buy?

**General Harrison.** Yes, sir, it is.

**Mr. McDade.** How does the Army intend to comply with last year's authorization act provision concerning sales of this howitzer to friendly foreign governments?

**General Harrison.** I will provide that for the record.

[The information follows:]

The UK/US license states that those items selected for production and delivery by the UK to the US are within the exclusive discretion of the US government. The Army will comply with the authorization act provisions by purchasing off-the-shelf materials, suspension parts, hardware, tools, spare parts, and fire control equipment necessary to meet the requirements of the act.

**Mr. McDade.** The budget includes $9.5 million for initial production tooling at Rock Island and Watervliet arsenals.

What is the basis for this request?

**General Harrison.** They make the trail assembly and the tubes, the trail assembly at Rock Island, the tubes at Watervliet.

[Additional information follows:]

Initial production tooling is required to facilitate for US production, since the M119 is a non-US developed weapon. Watervliet and Rock Island Arsenals, because of their familiarity with howitzer production, were the sources of the $9.5M tooling estimate. The Army has not decided at this time whether to compete this weapon with private industry. An examination is on-going to determine the trade-offs between competition and workloading of the arsenals to sustain an industrial mobilization capability, as permitted by the Federal Acquisition Regulations.

**Mr. McDade.** Why do you use arsenals for on-shore production?

Was any consideration given to soliciting private industry for this?

**General Harrison.** Sir, I know the arsenal act requires us to produce if it is economically advantageous to do it on shore. I don't know if there has been any consideration of competing that.

I will look at that and provide that for the record.

[The information follows:]

The Army is considering arsenals for the on-shore production of the M119, 105mm, Towed Howitzer because, once the United Kingdom's (UK) workshare of the agreement is accomplished and subtracted from the AAO, only 342 complete howitzers remain to be produced by US Army arsenals. This is an ideal quantity for the arsenals to produce; however, this quantity is not seen as being attractive to private contractors. The attractive feature is using US Army arsenals for production is that the Army will have a surge and mobilization base which can be retained.

The Army has not decided at this time whether to solicit private industry for this howitzer production. The Army's Materiel Command is conducting a study to determine the trade-offs between private industry competition and workloading of the arsenals to sustain an industrial mobilization capability, as permitted by the Federal Acquisition Regulations.

**Mr. McDade.** Thank you, Mr. Chairman.

**Mr. Chappell.** Mr. Livingston.

## ROBOTIC OBSTACLE BREACHING ASSAULT TANK (ROBAT)

**Mr. Livingston.** Thank you, Mr. Chairman. Congress has authorized and appropriated $9.6 million in fiscal year 1986 for the ROBAT program. During last year's hearings, the Army testified that the ROBAT responds to the number-one priority and defficiency identified in the war mission's area analysis.

Why has the Army deleted ROBAT from the fiscal year 1987 budget and used the entire fiscal year 1986 funding as an offset to the undistributed production?

**General Harrison.** Sir, that was an affordability cut and a prioritization. With our cut we couldn't afford it.

**Mr. Livingston.** The Army has received the first three of five prototypes and in addition, only $1.6 million in RDT&E fund is required in fiscal year 1986 to complete testing this year followed by type classification. But the Army didn't complete this segment of the program.

General **Harrison**. That is correct.

Mr. **Livingston**. Again prioritization?

General **Harrison**. Yes, sir.

Mr. **Livingston**. Would it be cost effective and sensible to complete this testing and type classification this fiscal year thus allowing the Army to be readied for production and have a complete data package for procurement and subsequent priorities allowed?

General **Harrison**. That is an excellent point and I will provide the answer to that for the record.

[The information follows:]

The Army determined that an additional $1.7 million would be needed in addition to the $2.1 million programmed in fiscal year 1986 to accomplish type classification of ROBAT. Given that production of the system had been terminated, it was decided to complete testing of the existing prototypes but not to continue development through type classification. Cost of completing this test is $1.6 million.

Mr. **Livingston**. I will submit the rest of the questions on this and on other subjects for you to answer for the record.

[Clerk's note.—Questions submitted by Mr. Livingston and the answers thereto follow:]

Question. By denying funding in fiscal year 1986 and 1987, aren't we wasting nearly $8.7 million already spent on this program as well as losing contractor capability to produce the required equipment when the need is recognized again?

General **Harrison**. The current fiscal year 1986 program will complete two prototype vehicles, engineer design tests and a full user test. The result will be that ROBAT will be in a posture permitting fielding within 18-24 months of a production decision, a logical stopping point given the 18 month delivery period for long lead components of ROBAT. Additionally, the $8.7 million ROBAT RDTE program has substantially benefited other development efforts in both countermine and ROBOTICS programs.

Question. How does the Army plan to address this number one priority deficiency now that ROBAT is dead?

General **Harrison**. The detection and neutralization deficiency remains a constant Army concern. Cost effective measures are being aggressively pursued to provide solutions. As we look to the RDTE community to provide much needed technological advancements, we currently rely on mine rollers, mine plows, clear lane marking system (CLAMS) and mine clearing line charge (MCLIC), being produced and fielded in FY87-88, to provide the short term solutions. These programs have been accelerated and expanded to fill the void left with the termination of ROBAT. Together these systems provide a credible near-term mine detection and mine neutralization capability to the maneuver commander.

### WARSAW PACT MINE STOCKPILE

Question. It is our understanding that the Warsaw Pact has a large stockpile of mines and that they have demonstrated their willingness and ability to use them effectively in Afghanistan and the Middle East. Is this true? How many mines do they have in inventory?

General HARRISON. The Soviets have an affinity for mine warfare which is borne out by their military doctrine and history. ———.

QUESTION. How does the Army intend to counter-measure these?

General HARRISON. In the short term the Army relies on the tank roller, tank plow, the clear lane marking system (CLAMS) and the mine clearing line charge (MICLIC) to provide both hasty as well as deliberate breach capability to the maneuver commander. In the long term the Army is pursuing an aggressive RDTE program to develop better stand-off detection capability as well as more efficient breaching capability.

QUESTION. Will these counter-measures work in minefields that are under heavy fire, as would be expected?

General HARRISON. The tank roller and plow, the clear lane marking system (CLAMS) and the mine clearing line charge (MICLIC) are systems which are attached to a tank and operated by the tank crew. It is expected that the tank will operate effectively in a minefield under heavy fire if it is adequately supported with suppressive fire and is working in concert with a predetermined breaching plan and or battle drill. Even a ROBAT would require similar support to effectively complete its mission

QUESTION. Are any of these solutions available today or in the near term? Which ones?

General HARRISON. The Tank Mounted Mine Clearing Roller, Tank Mounted Mine Clearing Plow, and Cleared Lane Marking System (CLAMS) for the M60 tank and the Mine Clearing Line Charge (MICLIC) are available. The M60 roller system and MICLIC are in production. The CLAMS systems will begin production in fiscal year 1986. The M1 plow begins production in fiscal year 1987. Kits to adapt the Roller and CLAMS to the M1 tank are in development now and will transition into procurement in fiscal year 1987.

QUESTION. Are these systems mobile enough to maintain pace with our modern manuevering forces? (M1 and Bradley)

General HARRISON. As previously indicated the tank mounted roller, plow and CLAMS systems are being adapted to be mounted on the M1 tank thus, capable of manuevering with an M1 tank equipped force.

QUESTION. Can they be airlifted effectively?

General HARRISON. All of these systems have airlift characteristics equivalent to the force which they support.

### MINE COUNTERMEASURE OPERATIONAL REQUIREMENTS

QUESTION. We are sure that the Army has conducted analyses concerning the operational requirements and cost effectiveness trade-offs for mine countermeasure systems. Would you please share these results with us?

General HARRISON. A cost and operational effectiveness analysis (COEA) was conducted on the Robotic Minefield Breaching System (ROBAT) and is a permanent annex of the Required Operational Capability (ROC). The analysis found that the ROBAT was the preferred operational alternative. However, the COEA demonstrates that considering total life cycle costs, ROBAT does not fair well.

particularly when the tank costs of the other alternatives are excluded from consideration.

### ROBAT SYSTEM

QUESTION. What about the ROBAT System? It was our impression that ROBAT would not only be a system that would allow aggressive responses to the mine threat, but would also be very cost effective at saving lives and vital combat systems such as the M1 and Bradley as well. Is this not true?

General HARRISON. Yes, the ROBAT System had the potential to provide effective systemic deliberate breaching capability to the maneuver commander and could save lives as well as decrease the possible loss of combat systems, such as the M1, during breaching operations. However, the decision to terminate the ROBAT System was based on affordability considerations not on the effectiveness of the operational capability of the system.

QUESTION. Will the ROBAT alternatives be effective under heavy fire or in very mobile situations?

General HARRISON. The tank roller and plow, the clear lane marking system (CLAMS) and the mine clearing line charge (MICLIC) are systems which are attached to a tank and operated by the tank crew. It is expected that the tank will operate effectively under heavy fire or in a mobile situation if it is adequately supported with suppressive fire and is working in concert with a predetermined breaching plan and or battle drill.

QUESTION. Will any alternative promote as aggressive a response as the unmanned ROBAT can.

General HARRISON. Because the tank roller and plow, the clear lane marking system (CLAMS) and the mine clearing line charge (MICLIC) systems are attached to a tank they can be as responsive as the unmanned ROBAT.

QUESTION. Cost-wise, how do others compare?

General HARRISON. The fiscal year 1987 estimated unit procurement cost for the individual systems are:

| | |
|---|---|
| Roller | $67,272 |
| Plow | $68,284 |
| CLAMS | $36,840 |
| MICLIC (Launcher only) | $3,906 |
| ROBAT (Based on first production quantity of 10) | $1,634,000 |

QUESTION. Schedule-wise, how do others compare?

General HARRISON. The M60 tank compatible Rollers, CLAMS and MICLIC began production in fiscal year 1986 or prior. Procurement of an M1 plow and adapter kits to mount the rollers and CLAMS to the M1 tank will begin in fiscal year 1987. The earliest ROBAT could begin production would be late fiscal year 1987.

QUESTION. How much money has the Army spent on the ROBAT to date?

General HARRISON. The current program will have spent $8.7 million through FY 1986.

QUESTION. How much does the Army estimate that it would cost to complete development and testing of the prototypes?

General HARRISON. Approximately $2.2 million additional funding is required to complete the full ROBAT RDTE Program through type classification.

QUESTION. How much does the Army estimate that it would cost to complete a pre-production prototype effort?

General HARRISON. The current program completes 2 preproduction prototypes and conduct of materiel and user testing. An additional $1.7 million would be required to carry the RDTE effort on through to type classification.

QUESTION. What upgrades or increases in capability would be required (if any) to make ROBAT a truly effective weapon system? How much would these cost to develop? How much cost per system would this add?

General HARRISON. The only near term upgrade envisioned for the current ROBAT system is the inclusion of the Drivers Thermal Viewer (DTV) capability. This would add approximately $23,000 per ROBAT. The DTV is being developed for other vehicles therefore no significant R&D cost would be incurred by the ROBAT programs.

QUESTION. Is it true that the Remote Control Systems developed for ROBAT is readily usable in many other vehicles from jeeps to trucks, to APC's, to other tanks? And is it true that this is the Army's only current Combat ROBOTICS Program?

General HARRISON. The Remote Control System developed for ROBAT is very basic and restricted to use at limited range, under direct control of an operator. Application to jeeps, trucks, APC's and other tanks, while possible, would severely limit their utility. The ROBAT Program is the most mature Army ROBOTICS Program but not the only Army Combat ROBOTICS Program. There are the Teleoperated Mobile Anti-Armor Project and the ROBOTICS Programs which incorporate new evolving technology in remote control and Artificial Intelligence which provide a nearly autonomous capability.

QUESTION. Wouldn't it make sense to at least take the ROBAT all the way through type classification and pre-production prototype effort?

General HARRISON. Taking ROBAT through pre-production to type classification only makes sense if it is reasonable to expect to obtain funding for procurement in the next several years. Evolving budgetary guidance suggests that additional funding will not be available. The Army, therefore, must allocate existing scarce funds into higher priority programs.

QUESTION. Wouldn't a completed program provide an off the shelf capability to go to production with, in time of need?

General HARRISON. Yes, but at an additional program cost of $1.7M. The Army determined that the RDT&E funding was not available from higher priority programs.

QUESTION. Wouldn't a completed Control System provide a cost and schedule effective basis for any of the Army's other planned Remote control and ROBOTICS Programs?

General HARRISON. The ROBAT remote control system represents very basic remote control technology. Other remote control and ROBOTICS requirements are well beyond this remote control stage and are incorporating new evolving technology which brings us closer to autonomous vehicle operation.

**Question.** As a system designated to conserve battle attrition of M1, M60 and Bradley fighting vehicle combat power, the small amount of funds required to complete RDTE and procure a pre-pre-production system would seem to argue persuasively to accept a miniscule decrement in the procurement of other systems or a trade-off. Recognizing the life saving and equipment saving potential of this system, it would appear that the Army should consider reprogramming funds to fully develop this capability. Is the Army willing to do this?

General **Harrison**. The termination of the ROBAT program was recommended by the Army only after significant cost reductions were required to meet additional funding constraints. The decision was made that in order to fund other higher priority requirements at an acceptable level some programs would be terminated. Those programs which provided an enhanced capability and or could be duplicated with system either in the inventory or being procured, were particularly vulnerable—the ROBAT was determined to be such a system and was terminated. To fund this multi million dollar program now would exacerbate an already most difficult situation and is not recommended at this time.

[**Clerk's note.**—End of questions submitted by Mr. Livingston.]

Mr. **Livingston**. Mr. Chairman, I have no other questions at this time.

## M60 TANK MODIFICATION

### APPLIQUE ARMOR

Mr. **Chappell**. Let me turn to the applique armor question.

The justification indicates that $26.8 million is for applique armor in fiscal year 1987 for the M60 tank modifications. What are the details?

General **Harrison**. That $26.8 million is to procure 1,350 tank sets to go on the tank.

[Additional information follows:]

This program is designed to provide increased armor protection against specific threat munitions. Each kit consists of mounting hardware and 95 reactive (explosive) tiles of two different sizes; i.e., 52 small (12"x12") and 43 large (18"x12") tiles. A total of 5400 kits will be procured over four years. FY87 is the second procurement year for applique armor. Initial procurement is planned for 4QFY86.

Mr. **Chappell**. I notice that the budget includes $48.3 million for the M60 series tank modifications, and last year the projection was $96.2 million for fiscal year 1987.

What accounts for that change?

General **Harrison**. Sir, the prioritization and what we had to cut back, the M60A3 is less of a priority than the M1 and we had to make some affordability cuts there and that is where we had to take some of it.

Mr. **Chappell**. What was actually cut?

General **Harrison**. I will provide that for the record.

[The information follows:]

The M60A3 modification program is a complex program which includes both conversion of the M60A1 tank to the M60A3 configuration and the modification of the entire M60A3 fleet with survivability enhancements. Programmed procurement of the twenty-four conversion and survivability enhancement kits varies significantly from year to year depending upon contract type, budget ceilings, RDT&E accomplishments, and conversion schedules. Conversion schedules in turn are influenced by fielding schedules for the M1 series tank. The FY87 budget of $96.2 million as reflected in the FY86 budget submit has changed for the following reasons.

Buy out of laser rangefinder and solid state computer in FY85-86 with multiyear contract. FY87 reduction of $26.8M.

Stretchout of auto fire suppression system procurement. FY87 reduction of $16.4M.

Increase in FY86 budget to allow less costly application of tank thermal sight optical enhancement during TTS manufacturing. FY87 reduction of $20.7M.

Acceleration of application of applique armor and reduction in schedule from four to three years. FY87 increase of $22.OM.

Other changes in kit procurement quantities. FY87 reduction of $6.OM.

Mr. Chappell. The initial funding of $25.6 million is shown for applique armor in fiscal year 1986. Since this was not forecast last year, where did this money come from?

General Harrison. I will provide that fot the record, sir.

[The information follows:]

Applique armor is part of the M60 Mod line. It has been reflected in that budget line as "Caddy Bag" since FY83. Differences in quantities between the FY86 caddy bag program and FY87 applique armor program resulted from the decision to field this capability as soon as possible.

Mr. Chappell. When will the committee receive notice of this modification new start as required in last year's report?

General Harrison. I will provide that for the record.

[The information follows:]

Applique armor is not a new start program. It was previously referred to as "Caddy Bag."

Mr. Chappell. Describe, if you will, what this applique armor is. What sort is going to be procured and what alternatives were considered?

General Harrison. Applique armor is applied to the tank and there are a couple of kinds, one of which you just put high hard steel on there that stops some thing from going through. The other type is the reactive armor where you have an explosive there that when you hit the plate, there will be explosion outside the tank that will stop the jet from going through. We are putting that reactive armor on the Bradley Fighting Vehicle as a survivable improvement. The applique armor on the M113 is a Swiss-cheese type of high hard steel that tries to stop the bullet from going through. The tank has special armor separate from the applique. Also, we are putting reactive armor on the M60A3.

[Additional information follows:]

The applique armor selected for the M60A3TTS tank consists of 95 individual tiles of reactive (explosive) armor. Reactive armor technology was chosen because it is very effective against specific threats, is much lighter per square foot than other armors with comparable performance, and is inexpensive to produce. The BLAZER system used by the Israelies was considered, but rejected because the U.S. designed tile provided greater protection and was easier to support logistically.

Mr. Chappell. Have you tested this type of armor and if so, what are the results?

General Harrison. The applique, just the steel we have tested; the reactive armor is a new technology that has come on line in the last six to eight months. We are going to test two different designs when we shoot the Bradley. We will provide the results of that when we provide test report in June.

[Additional information follows:]

Comprehensive developmental, safety and DT II systems testing has been conducted on applique armor. Test results have demonstrated that the applique armor will satisfy the TRADOC protection requirement, details of which are classified. Test reports are currently being evaluated against all materiel need requirements in preparation for a production decision In Process Review (IPR) to be held in 3QFY86.

Mr. CHAPPELL. What additional tests are planned and when?

[The information follows:]

Follow on DT II tests to evaluate recent design changes are currently underway at Aberdeen Proving Ground and will be completed in April 1986 to provide additional data for the Production In-Process Review. RAM-D vehicle testing is continuing on two tanks at APG with a scheduled completion date of July 1986. A First Article Initial Production Test is planned to begin in December 1986. The Army plans to continue its R&D tile efforts (currently underway at the Ballistics Research Laboratory) to further improve applique armor.

Mr. CHAPPELL. Have you tested any alternatives?

General HARRISON. We are testing two types of that. It is some that has been developed by the Israelis and we are testing some developed by our ballistic laboratory.

Mr. CHAPPELL. How many of the M60 series tanks will be capable of carrying this applique armor?

General HARRISON. Fifty-four hundred, sir.

Mr. CHAPPELL. Is that all of them?

Colonel HOLEMAN. That is not the entire fleet of M60s that is the 5400 M60A3, the latest version of the M60.

Mr. CHAPPELL. How much does it weigh and what impact does it have on mobility of the tank?

General HARRISON. The weight of the M60A3 is 57 tons. What that applique will do to the tank's mobility——

Mr. CHAPPELL. How much does that mean that you have added to the tank? How much of that 57 tons is applique armor?

General HARRISON. I will have to get that for the record. I don't want to give you a number I am not sure of.

Maybe two tons, but I will provide that for the record exactly.

[The information follows:]

Applique armor weighs approximately 3800 lbs. per tank. Testing to date indicate that there will be no significant impact on vehicle mobility. Durability testing is currently underway at Aberdeen Proving Ground and will continue through 4QFY86.

Mr. CHAPPELL. No mobility?

Colonel HOLEMAN. Limited or none.

General HARRISON. We are putting it on the Bradley. We have 6- to 7,000 pounds that we can put on there that we have done an analysis that says that we will lose a little bit in our road speed, but as far as our dash speed, which is what is really important, the ability to get behind one object to another will not be significantly degraded with that. We have looked at that and feel comfortable that we have the growth potential to do that with the Bradley.

Mr. CHAPPELL. What is your procurement strategy?

General HARRISON. On the Bradley we are forecasting the money in 1987, $81,000 per vehicle to buy that as well as the other survivability improvements that we are asking for.

[Additional information follows:]

Applique armor requirements will be procured over a four year period (1350 sets per year) starting in FY86. The Milan Army Ammunition Plant will produce the tiles and the mounting hardware will be produced by Rock Island Arsenal.

Mr. CHAPPELL. How are you going to go about buying it?

General HARRISON. We will test and see what is the best, and then we will compete it.

Mr. CHAPPELL. Please answer the remaining questions for the record.

[CLERK'S NOTE.—Questions submitted by Mr. Chappell and the answers thereto follow:]

QUESTION. For the record, show the funding profile, including quantities.

General HARRISON. The applique armor procurement funding profile is as follows:

| | FY86 | FY87 | FY88 | FY89 | To complete |
|---|---|---|---|---|---|
| $MIL | 25.4 | 26.8 | 28.0 | 29.3 | 0 |
| QTY | 1350 | 1350 | 1350 | 1350 | 0 |

### LASER PROTECTION

QUESTION. The budget also includes $7.4 million for laser protection. What are the details of this program?

General HARRISON. The laser protection program is designed to prevent damage to optics and to protect the crew from eye damage caused by laser energy. The following optics are included in the M60 program:

| | |
|---|---|
| M60A3TTS | AN/VVG-2 Laser Rangefinder |
| M60A3TTS & M728 CEV | M36E1 Commander's Periscope |
| M60A3TTS | M105D Gunner's Telescope |
| M728 CEV | M105F Gunner's Telescope |
| M728 CEV | M32CE1 Gunner's Periscope |
| M60A3TTS & M728 CEV | M27 Driver's Daylight Periscope |
| M60A3TTS & M728 CEV | M37 Loader's Daylight Periscope |
| M60A3TTS & M728 CEV | AN/VVS-2 Driver's Night Viewer |
| M60A3TTS & M728 CEV | Vison Blocks |

QUESTION. What are the development and testing milestones?

General HARRISON. Laser Protection Program milestones are as follows:

| | |
|---|---|
| Component Laboratory Testing Complete | 4QFY86 |
| Vehicle Systems DT II test Complete | 1QFY87 |
| Production Decision IPR | 2QFY87 |
| Production Contract Award | 2QFY87 |
| First Hardware Delivery | 4QFY87 |
| Initial Vehicle Application | 1QFY88 |

QUESTION. For the record, show the procurement profile, including quantities.

General HARRISON. Laser Protection Procurement funding profile is as follows:

| | FY87 | FY88 | FY89 | FY90 | To complete |
|---|---|---|---|---|---|
| $MIL | 7.4 | 13.6 | 11.3 | 20.4 | 0 |
| QTY | 772 | 1774 | 1414 | 3074 | 0 |

## TTS OPTICAL PERFORMANCE ENHANCEMENT

Question. No funds are included for the TTS Optical Performance Enhancement. Last year, $17.3 million was provided for this program and $18.1 million was projected for 1987. Why has the FY 1986 program been increased to $28.5 million and FY 1987 funds deleted?

General Harrison. FY86 procurement was increased to take advantage of the significant cost savings available by forward fitting this modification rather than applying it in retrofit. FY87 funding has been eliminated because quantities forward fitted in FY86 will meet FY87 needs. FY86 is the last year available for the forward fit program which applies this improvement to the remaining tank thermal sights in the production process.

Question. What are the details of this program?

General Harrison. The Tank Thermal Sight Optical Performance Enhancement Program provides laser protection for the tank thermal sight. Initial procurement in FY86 will allow the contractor, Texas Instruments, to forward fit (on the assembly line) at least 960 new production units. These forward fit units will be produced at a substantial savings as compared to subsequent retrofitted tank thermal sights.

Question. What is the current procurement profile, including quantities.

General Harrison. The procurement funding profile for TTS OPE is as follows:

| | FY86 | FY87 | FY88 | FY89 | FY90 | To complete |
|---|---|---|---|---|---|---|
| $MIL | 28.6 | 0 | 18.5 | 11.1 | 11.6 | 0 |
| QTY | 2601 | 0 | 1356 | 1040 | 985 | 0 |

[Clerks note.—End of questions submitted by Mr. Chappell.]

Mr. Chappell. I would like to ask a general question on laser protection ———.

General Harrison. ———.

We are going to do that in all the systems. It is ongoing and we will modify our existing systems to incorporate that.

## Squad Automatic Weapon

Mr. Chappell. Just a couple of quick questions on the Squad Automatic Weapon.

The budget includes $12.9 million for procurement of the Squad Automatic Weapon (SAW) a 5.56 millimeter gun used primarily by infantry units. Initial procurement funding was provided several years ago, and 1985 and 1986 funding eliminated as a result of problems discovered during field tests.

What were these problems? Do you still have problems with it?

General **Harrison**. No, sir. We are fixing that. I shot that weapon when people were recording problems and we had things that needed to be fixed, we thought. Those are being incorporated now and we are going to continue procurement of that.

We are holding the contractor responsible to fix the things he was responsible for before we do that, and we are putting a heat shield, revising the enjection port cover so you don't cut your hand when you pull back on the lever and the buffer assembly needs to be fixed. We are fixing that and will continue procurement of it.

Mr. **Chappell**. Put the rest of the questions in the record.

[Clerk's note.—Questions submitted by Mr. Chappell and the answers thereto follow:]

**Question**. How much will these changes add to the cost of the weapon?

General **Harrison**. We estimate that the modified weapon design will increase the cost of the Squad Automatic Weapon by less than 5%.

**Question**. What are the current program milestones?

General **Harrison**. The Army's major milestones for the resolicitation of the Squad Automatic Weapon Request for Proposal are as follows:

| | |
|---|---|
| Issue Competitive Request for Proposal | 1st QTR 87 |
| Contract Award for Follow-on Production | 2nd QTR87 |
| Delivery of Follow-on Weapons | 2nd QTR 89 |

**Question**. What is the procurement strategy?

General **Harrison**. The Army plans to procure the remaining required Squad Automatic Weapons through full and open competition.

**Question**. The Marine Corps has been buying the SAW for several years and seems satisfied with the current configuration. With respect to the hot barrel problem, a Marine spokesman is quoted as saying "We teach Marines not to touch a hot barrel". Why can the Army not use a similar approach?

General **Harrison**. The Army also teaches its soldiers not to touch a hot, exposed barrel. However, in realistic combat simulated training exercises, soldiers subjected to stressful situations have picked up the Squad Automatic Weapon by its barrel and have burned their hands severely. A heat shield is a relatively simple solution to this design deficiency and will ensure that none of our soldiers inadvertantly injure themselves in combat or during training situations.

[Clerk's note.—End of questions submitted by Mr. Chappell.]

Mr. **Chappell**. Mr. Miller?

Mr. **Miller**. No questions.

Mr. **Chappell**. Mr. Murtha?

Mr. **Murtha**. No questions, Mr. Chairman.

### M88 RECOVERY VEHICLE

Mr. **Chappell**. On the M88 recovery vehicle, the budget includes $42.8 million for procurement of the M88 recovery vehicle. No quantities are shown. Last year's budget forecast annual M88 procurements of 180.

What has changed in this program since last year?

General HARRISON. It is 42.8 for widges, hull roller plates and tooling. We didn't properly identify that as an advanced procurement form and we apologize for that. We will do that better.

Mr. CHAPPELL. Is this M88 capable of recovering the M1A1 tank?

General HARRISON. The improved M88 that we are asking for money for will be, yes, sir.

Mr. CHAPPELL. Currently it is not?

General HARRISON. Yes, sir.

Mr. CHAPPELL. How many of those do you have?

General HARRISON. Twenty-four hundred and fifty-six, sir.

Mr. CHAPPELL. When did the Army first learn that this vehicle would not recover the M1A1 tank, and why was the M88A2 procurement not forecast last year?

General HARRISON. Sir, the exact date I could not tell you; it is not a good story. We should have anticipated this before and we have got a problem we are trying to fix right now.

I don't know the exact date.

[Additional information follows:]

The Army has been aware of this problem since 1983. During that year and 1984 our efforts were devoted to determining the nature and scope of the problem and soliciting informal proposals from industry to correct it. As a result of these efforts, we concluded that product improvement of the M88A1 offered the most affordable solution if it could do the job. To determine the capabilities of such a vehicle, the Army conducted a limited test of an improved M88A1 concept vehicle during May and June 1985. Results from this test were encouraging, but inconclusive because the concept vehicle experienced a unique braking problem on steep downhill slopes. This problem was corrected and satisfactorily demonstrated to the Army in November 1985. In December 1985, the Army made the decision to implement an M88A1 improvement program

Mr. MURTHA. Mr. Chairman.

When you are done, I would like to ask just a couple of questions about wheeled vehicles. I know we are talking about the Bradley.

Mr. CHAPPELL. Let me finish this one section.

What are these changes that you are making in this recovery vehicle?

General HARRISON. We are going to make it heavier so it can tow safely a 65-ton vehicle, which is what the tank has the potential to go to. A 65-ton vehicle right now, it can't safely haul that.

[Additional information follows:]

The engine horsepower is being increased, weight in the form of armor is being added, and winching and lifting boom capabilities are being improved.

Mr. CHAPPELL. It is amazing we bought this many tanks and didn't know it wouldn't recover the M1A1 tank.

Colonel HOLEMAN. It will recover on level ground but when you have to go up steep hills, it makes it very difficult. Level ground, it can do it.

Mr. CHAPPELL. It takes two to do it?

General HARRISON. Or another tank, which you don't want to do. There is always the alternative of pulling it with another tank but that takes a tank out of action.

Mr. CHAPPELL. The M88A1 costs about $850 thousand. How much will the M88A2 cost?

General Harrison. The improved M88A1 is estimated to cost $955 thousand in FY86 dollars.

Mr. Chappell. What is the basis for making the advanced procurement request?

General Harrison. So we can field the safety item as quickly as we can.

We have a problem. As you say, we have been too late working with it, and now we have to do something about it.

Mr. Chappell. When will you first have those going off the line?

General Harrison. First quarter of 1989 is what we are projecting.

Mr. Chappell. What are you going—is there any way to improve the ones you already have?

General Harrison. No, sir, we will backfill those to replace older recovery vehicles.

Mr. Chappell. This handles the M60 tank all right?

General Harrison. It does.

Mr. Chappell. Please answer the remaining questions for the record.

[Clerk's note.—Questions submitted by Mr. Chappell and the answers thereto follow:]

Question. What is the research and development program and funding profile?

General Harrison. The Army is submitting a reprograming action for $8.0M in FY86 to complete modification and testing of an existing engine, transmission, boom, and winch; and to design the armor package for the improved M88A1. Requested funding of $9.4 million in FY87 will be used to construct and begin test and evaluation of prototype vehicles. Programmed funding of $7.8M in FY88 will be used to complete government and contractor test and evaluation leading to a production decision.

Question. What are the program milestones for the M88A2?

General Harrison. Definitive milestones have not yet been established.

Question. What is the procurement strategy?

General Harrison. The Army does not expect to make a decision on the acquisition strategy until April 1986. Currently both sole source and completion alternatives are being considered.

Question. Will M88A1 vehicles be modified to the A2 configuration? If so, at what cost?

General Harrison. No. Existing M88A1 vehicles supporting tank units will be used to replace the M578, which currently is inadequate for supporting Bradley and self propelled howitzer units.

Question. The budget back-up information indicates that the fiscal year 1987 request is actually for advance procurement. Why it this not shown on a separate advance procurement line in the P-1?

General Harrison. Failure to establish as separate P-1 was an oversight.

Question. What is the basis for making an advance procurement request when such funding has not been provided for this program in the past?

General Harrison. Over the many years of the M88A1 procurement program the Army has gradually extended the funded delivery period to allow the program to be executed without advance procurment. Commonality of the engine and transmission with the M60 series tank facilitated this strategy because it allowed the contractor to minimize his lead times with little risk. The M88A1 product improvement program, on the other hand, follows a year break in production and uses a transmission and engine that is only eighty-five percent common with the M60 tank fleet. More importantly, the Army urgently needs this vehicle in the field today and therefore, requires that initial deliveries be provided as soon as possible. It is anticipated that as production of this vehicle becomes more stable, advance procurement can be eliminated.

[CLERK'S NOTE.—End of questions submitted by Mr. Chappell.]

## TRACKED VS. WHEELED VEHICLES

Mr. MURTHA. I wanted to ask a question about the tracked versus the wheeled vehicles similar to the Bradley.

The Marine Corps did a study and came down on the side of the wheeled vehicle. Is there a possibility that we can replace something like the Bradley with wheeled vehicles?

General HARRISON. Sir, I know of no way to do that with the current requirements and the survivability we have of maneuvering the Bradley and the survivability with the tank, maneuvering with the tank. I know of nothing that we could do on a wheeled vehicle that would allow us to do that.

Mr. MURTHA. Have you looked at the Marine Corps study at all?

General HARRISON. I personally have not.

Lieutenant KAUFFMAN. The Marine Corps requirement for that wheeled vehicle is different from ours. Our Bradley and M1 tank must have compatible mobility with one another and the studies show that a wheeled vehicle cannot have cross-country compatible mobility with a tracked vehicle.

Mr. MURTHA. I saw what they call a Dragon wagon, a fairly expensive vehicle. I was amazed at the mobility of that vehicle.

Did you use that as an example when you were comparing?

Lieutenant KAUFFMAN. Yes, sir. The comparable studies were made by our engineers at the Mississippi Waterways and they had run all of those types of vehicles across different types of terrain and the wheeled vehicles are usually competitive on the firm ground but on wet ground you have a problem.

In Central Europe, you have a lot of rain and true problems with plowed fields, and that type of thing.

Mr. CHAPPELL. Please answer the remaining questions for the record for answer at this point.

[CLERK'S NOTE.—Questions submitted for the record and the answers thereto follow:]

## 155MM SELF-PROPELLED HOWITZER MODIFICATION

QUESTION. The budget includes $20.8 million for 155mm self-propelled howitzer modifications. Last year, Congress provided $15.7 million in this line, including $14.3 million to initiate procurement of Howitzer Extended Life Program (HELP) modifications. The current budget indicates that the program has apparently been restructured. Please explain the program changes since last year.

General **Harrison**. The Howitzer Improvement Program (HIP) and the Howitzer Extended Life Program (HELP) were two separate Product Improvement Programs (PIP) for the M109 howitzer when the FY86 budget was submitted to Congress. The HELP PIP was to be applied to the entire M109 howitzer fleet while the proposed follow-on HIP PIP would be applied to only 1700 howitzers. However, the HELP items required additional testing which delayed implementation of the program. In order to save significant costs involved in returning as many as 400 previously HELP modified howitzers to the depot for application of HIP PIPs, the Army modified its strategy and decided to merge the programs. By restructuring the program the Army has lowered program risks by delaying its planned procurement of modification kits until completion of both contractor and government conducted production qualification testing, and a two phased force development test and evaluation which will be completed by 3rd quarter FY88. The FY87 program funds will be reduced to $6M to fund other (non HIP unique) M109 fleet modifications.

**Question**. What specific changes are being made to the vehicle under your revised HELP/HIP program?

General **Harrison**. In merging the two programs the Army has selected the successful Howitzer Extended Life Program (HELP) modifications for incorporation into the new M109A5. The Howitzer Improvement Program (HIP) configuration will include the following items:

SINCGARS radio
Modified Armament System
Electrical/Hydraulic Improvements
MICRO Climatic Cooling
Gun Drive Servos
Prognostics
Automatic Fire Control System
Kevlar Spall Reduction Liners
External Stowage Baskets
Final Drive Disconnect
New HIP Turret W/Propellant Segregation
HALON Fire Suppression
AGPS Sensors
Driver Night Vision
Remote Travel Lock
Ventilated Facepiece System
Turret Drive Improvements
Automative RAM Improvements
Desert Cooling
Sensor Connector Cover
Diagnostic Systems

**Question**. What is the total cost of the development program, the procurement program, and modification installations?

General **Harrison**. We have budgeted $145.4M for our development effort. The current procurement budget estimate is $1,062.7M for the procurement of modification kits with an additional $189.5M in OMA for kit installation.

**Question**. How many howitzers will be modified?

General **Harrison**. The Army plans to modify 1700 howitzers.

**Question**. The contract with the developing contractor has ceiling priced production options for the first two years, fiscal years 1988 and 1989. How many modifications will be procured in each year?

General **Harrison**. The Army plans to procure 80 kits in Fiscal Year 1988 and 153 kits in Fiscal Year 1989.

**Question**. What is the procurement strategy beyond Fiscal Year 1989?

General **Harrison**. The Army will use the Technical Data Package developed during the current contract as the basis for a competitive solicitation beginning in Fiscal Year 1990.

**Question**. What are the development and testing milestones in the revised program?

General **Harrison**. The revised program milestones are as follows:

| | |
|---|---|
| FDTE I | 1st QTR FY87 |
| Ballistic Hull & Turret Test | 1st QTR FY87 |
| Contractor Production Qualification Test | 4th QTR FY87 |
| Government Production Qualification Test | 1st QTR FY88 |
| Logistics/Maintenance Demonstration | 1st QTR FY88 |
| FDTE II | 2nd QTR FY88 |
| Limited Production IPR | 3rd QTR FY88 |
| Technical/Operational Testing | 3rd QTR FY88-1st QTR FY89 |
| IOC | 3rd QTR FY89 |
| Full Production | 3rd QTR FY90 |

**Question**. Under the revised program, what are the Howitzer Improvement Program (HIP) procurement funding requirements in Fiscal Year 1986 and 1987?

General **Harrison**. The Army has no requirement for HIP procurement funding in Fiscal Year 1986 but requires $3.1M in Fiscal Year 1987 for long lead cannon forgings.

**Question**. Why is procurement funding proposed in these years when the first procurement is not until Fiscal Year 1988?

General **Harrison**. Procurement funding is required for the completion of previously funded modifications which will be applied to the entire M109 fleet.

**Question**. What is the justification for advance procurement, and why is it not identified as such in the P-1?

General **Harrison**. The $3.1M requested in Fiscal Year 1987 is to provide long lead forgings which are required for cannon tube production. It was not identified as such in the P-1 due to an administrative error.

**Question**. What are the procurement funding requirements in Fiscal Year 1986 and 1987 for non-HIP modifications, and why have they changed?

General **Harrison**. The two non-HIP modifications budgeted with procurement funds both in Fiscal Years 1986 and 1987 are for secure lighting and improved illumination for fire control instruments, and requirements are as follows:

| | FY1986 | FY1987 |
|---|---|---|
| Secure Lighting | 1.69M | -0- |
| XM785/M203 Compatibility | 2.18M | 2.95M |

The secure lighting Product Improvement Program increased from $.242M in the 1986 budget submission to $1.69M in the 86 column of the Fiscal Year 1987 because of a change in the scope of work which now includes incorporation of the Army's blue light conversion program. The increase in the XM785/203 compatibility Product Improvement Program is due to a revised program cost estimate plus inflation.

**Question.** We have seen in many programs that development and testing have slipped, yet the service will enter production prematurely in order not to lose an attractive procurement option. What provision does your contract with BMY have for delaying the exercise of the procurement option in the event that the additional testing is required?

General **Harrison.** The HIP contract is structured to premit the government to exercise the option to enter Limited Production (LP) when ready. Should there be any problems with HIP to preclude entry into limited production, the limited production would be delayed until the problem is resolved.

**Question.** The HIP modification will include a new turret. Why is a new turret required, and how will you go about developing it?

General **Harrison.** After comparing to costs required for the refurbishment of the current M109 turret with the cost of a new turret, the Army has decided to use a new turret. Modification of the current turret would be labor intensive and would be a patch work of fixes which would result in a weakened structure with less reliability than a new turret. The new turret facilitates incorporation of the HIP modification kits, and will readily incorporate integration of either the advanced or extended range cannons and mounts at the full production decision. The new turret will feature higher survivability, better human factors and increased structural integrity. Costs associated with the modification of the old turret compared with the development and production of a new turret are a wash. The turret is being developed under the current contractual scope of work.

**Question.** The Israeli's have long has a requirement for a loader assist. What are the Army's plans in this regard?

General **Harrison.** The Army will monitor the developmental and operational testing of the loader assist device which will be tested on the Israeli configured HIP. If there are significant operational advantages which accrue from this device, the Army will consider its adoption as a pre-planned product improvement.

### FIELD ARTILLERY AMMUNITION SUPPORT VEHICLES

**Question.** The budget include $67.5 million to pocure 141 field artillery ammunition support (FAASV) vehicles. Last year, you forecast a budget of $98.5 million. What accounts for the change?

General **Harrison.** The change from the previous year's budget request is primarily a matter of affordability. As with many other systems, we simply cannot afford to procure all we would like to.

**Question.** What was the old acquisition objective, what is the new one, and why did it change?

General **Harrison.** The Army's original procurement objective for the FAASV was 1486 which included vehicles for both 155mm howitzer battalions and 8 inch howitzer battalions. The Army's current procurement objective is for a total of 975 vehicles. This number reflects an Army decision to field the FAASV to only forward deployed 155mm howitzer battalions, two CONUS based 155mm howitzer battalions, POMCUS and a limited number for units designated to use POMCUS stocks and for the training base.

Question. Last year, you stated that the FAASV would be procurd competitively beginning in Fiscal Year 1986. What are you current plans?

General Harrison. The Army plans to award a sole-source single year contract with options to BMY, the current contractor for the FAASV.

Question. Why is competition being abandoned in this program?

General Harrison. The Army planned a competitive procurement of the FAASV when the procurement objective was for a total of 1486 vehicles. A recently completed economic analysis concluded that with a reduced procurement objective on only 975 vehicles, the Army could realize a lower overall program cost by awarding a sole-source, non-competitive contract to BVMY, the current production contractor. The Army plans to award a contract within the next thirty days.

## M113 Family of Vehicles

Question. The Budget includes $64.1 million for procurement of 300 M577 Command Post Vehicles. This is one of the members of the M113 family of vehicles. In recent years, the production line for these vehicles has been sustained at less than the economic rate by a combination of foreign sales and continued low rate U.S. procurement. Does the Army desire to keep a warm production line for the M113 family of vehicles?

General Harrison. Yes. The current Army strategy is to program a base buy of 300-400 vehicles per year in order to reduce shortages, provide a stable production line, and give Allies a place to buy reliable personnel carriers.

Question. How does the fiscal year 1987 budget sustain the production line? What is the minimum sustaining rate for this line, and what rate will be supported by your budget?

General Harrison. The minimum sustaining rate for the M113 family of vehicles is approximately 600 vehicles per year depending upon the mix of vehicles. It is anticipated that with the Army annual projected buys of M113 Family of Vehicles, combined with FMS, direct coantractor sales, and Army Reserve and National Guard dedicated buys, the current production line will continues at or above the minimum sustaining rate through the fiscal year 1991. Recent history has shown that Foreign Military Sales alone have been approximately 200-300 vehicles a year.

Question. How many more of the various vehicles in this family will the Army have to procure to satisfy its acquisition objective? How many are funded in the current five year budget?

General Harrison. After the quantities submitted in the Fiscal Year 1987 President's Budget are procured, the Army would have to procure approximately 9838 additional M113A3s and 2110 additional M577s to reach its full AAO. To fill high priority units, POMCUS sets, and war reserve, the Army must procure approximately 4831 M113A3s and 1439 M577s. The quantities of M113A$^{3}$ include the procurement necessary to offset conversion of M113 chassis to FIST-V and M1059 Smoke Generator Carrier. There are approximately 1600 M113 family of vehicles currently programmed in fiscal yeas 1987-1991.

**Question.** The budget also includes $48.4 million for modifications to these vehicles. A major component of this program is Block I survivability upgrades, for which $32.3 million is budgeted. What do these mods include?

General **Harrison.** The Block I modification program consists of the RISE power train, internal mounted/moveable spall suppression liners, armored external fuel tanks and mounting provisions for the external armor kits.

**Question.** What is the total cost of the Block I mod program? Provide the funding for the record.

General **Harrison.** The unit procurement cost for the Block I survivability mod kits is approximately $110 K in Fiscal Year 1987 dollars. The current funded profile below will procure approximately 230 kits through Fiscal Year 1991:

In millions of dollars

| | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | To complete |
|---|---|---|---|---|---|---|---|
| Amount | [illegible] | [illegible] | [illegible] | [illegible] | $41.8 | $59.4 | [illegible] |
| Quantity | [illegible] | 795 | [illegible] | [illegible] | [illegible] | 496 | 5,450 |

As affordable, Army plans to procure enough kits to upgrade approximately 6,500–8,000 M113 family of vehicles to include the Fire Support Team Vehicle and improved TOW Vehicle.

**Question.** Block II mods, involving additional survivability improvements, are funded at $3.2 million in fiscal year 1987. What do these include? what specifically will be procured with the $3.2 million in 1987?

General **Harrison.** The Block II modification kit includes bolt-on external armor. The dollars programmed cover kit procurement and testing. Approximately 81 armor kits will be procured with the $3.2 milion budgeted in fiscal year 1987.

**Question.** What various approaches to external armor has the Army considered for the M113 family of vehicles, which one has been decided, and why?

General **Harrison.** The Army surveyed existing and emerging armor technologies through Ballistc Research Laboratories (BRL), Army Material and Mechanics Research Center (AMMRC), foreign sources and industry before conducting tests on the most promising consepts. Among the armor concepts tested were: P900, steel lamine, ceramic Composite $B_4C$, Ceramic Composite $T_iB_2$, Cermaic Composite $Al_2O_3$, as well as a number of specialty armor concepts. P900 armor was chosen since it provided the required protection that the lowest weight and cost.

**Question.** What are the testing milestones for external armor?

General **Harrison.** The testing milestones are as follows:

| *Contractor* | *Comletion milestone* |
|---|---|
| Preliminary design definition/refinement | Complete |
| Vehicle durability test with prototype armor kit (2 month test) | June 1986 |
| Ballistic test of Vehicle with armor kit (2 month test) | June 1986 |
| Government—Programmed test: DOD/BRL Ballistics test of 2 vehicles with armor kits (12 months) | May 1987 |
| Government—Potential tests: Durability tests of vehicle with external armor (6 months) | July 1987 |
| Ballistics tests of vehicle with armor kit (2 months) | March 1987 |

Question. What is the procurement strategy? What is the total cost and funding profile?

General Harrison. The armor kits will be solicited on a competitive basis utilizing the Technical Data Package currently being developed. The current strategy is procure an estimated 4,000 to 6,000 kits for selected vehicles used in the forward battlefield area.

The unit cost of the armor kit is estimated at $31.4K in Fiscal Year 1987 dollars. Based on affordability, the Army plans to procure approximately 2160 kits through FY91. The current funded profile through the FYDP is as follows:

|  | FY87 | FY88 | FY89 | FY90 | FY91 | To complete |
|---|---|---|---|---|---|---|
| Amount | $3.2 | $9.8 | $19.6 | $14.2 | $26.3 | $62.4 |
| Quantity | 86 | 304 | 593 | 420 | 760 | 1735 |

[Clerk's note.—End of questions submitted by Mr. Chappell.]

## Cannon Tube Forgings

Mr. Chappell. Let me turn to the cannon tube forgings for surge.

The budget includes $9.6 million for cannon tube forgings for surge. The back-up material indicates that this is a one-time expenditure.

What are the details of this program?

General Harrison. We are buying 120-millimeter preforms for tubes and for breach rings and breach blocks so that we have the capability to surge those items in event that we needed them for conflict.

We will also continually rotate our stocks, but we are building up a capability for surge with that amount and it is for those specific things, the 120-millimeter tank gun.

Mr. Chappell. This problem was not forecast last year. Why was that?

General Harrison. Sir, this has been something the Office of the Secretary of Defense has directed. This is our first year of effort.

Mr. Chappell. What specifically would be procured?

General Harrison. We will be procuring 120-millimeter preforms, which are blocks, so you can cut a tube out of it, breach rings and breach blocks. Those are the three items for the 120-millimeter tank gun.

Mr. Chappell. The Army budgets long lead funding for the basic vehicle, engine, fire control components, transmission, and gun mounts as well as the cannon. Why are you not requesting surge funding for these components as well?

In other words, aren't you going to have cannons that are not going to have vehicles for?

Colonel HOLEMAN. This is the first step in a program to improve surge capability for all items for all systems. If this step goes well, we will take the next step next year, and maybe that will be transmissions and engines.

Mr. CHAPPELL. Are the other steps funded?

Colonel HOLEMAN. Not at this time.

Mr. CHAPPELL. Do you anticipate they will be funded next year?

Colonel HOLEMAN. Not in 1988 right now. OSD has money that they are putting against this for all services. We were the lead service to get the lead money.

Mr. CHAPPELL. What is the impact on the proposal on the lead time for cannon tubes?

Colonel HOLEMAN. It goes from ten months to three months.

Mr. CHAPPELL. Please answer the rest of the questions for the record.

[CLERK'S NOTE.—Questions submitted by Mr. Chappell and the answers thereto follow:]

QUESTION. What surge capability will this proposal provide for the M1 tank itself?

General HARRISON. This $9.6M would allow 120mm cannon production to be increased to 148 tubes a month in three months rather than ten months.

QUESTION. According to an Army information paper this funding came from an "OSD established Industrial Surge Wedge fund". Would the Army have funded this program if it had to use its own budget resources?

General HARRISON. I do not have an answer to that hypothetical question, since this item did not compete in the Army's POM process.

QUESTION. What impact will this proposal have on production and workforce levels at Watervliet Arsenal?

General HARRISON. It will have no impact during normal peacetime conditions.

## MOBILIZATION BASE TRAINING EQUIPMENT

QUESTION. The budget includes $17.0 million for Mobilization Base Training Equipment. What are the details of this request?

What is the total cost of this program?

Why was this request not forecast last year?

Why is Weapons and Tracked Combat Vehicle the only procurement appropriation in which equipment of this sort is being funded?

General HARRISON. In recent years the Army has been criticized for its inability to quickly access and adequately train the required manpower to man and sustain the force after mobilization. The Army has initiated actions to specifically identify the major constraints to Mobilization Training Base expansion and reduce or eliminate those constraints. A lack of adequate training equipment for the USAR Training Divisions has been identified as a major constraint of the Mobilization Training Base. Major end items included in these equipment shortages are howitzers, tracked and wheeled vehicles, and a wide variety of other military equipment. The total resource bill for "fixing" the equipment shortfall in the Mobilization Training Base could exceed \$750M. Of that total requirement, a large portion is not immediately executable, as many of the items are not presently scheduled for procurement. The non-procurable portion of the shortage will be addressed through redistribution programs to the extent possible. Additional money will be included in the budget outyears to complete this "fix." The general strategy is to buy required items that are scheduled for procurement, in order that items procured may be obtained at the lowest possible unit cost. This requirement was forecast in early FY 85. It was not forecast earlier because comprehensive data was not available on which to base a decision as to the Mobilization Base Training Equipment requirements. This appropriation does include other than WTCV funds. OPA funds are required to support acquisition of training aids, devices and equipment types other than WTCV. \$3M in OPA funds are included in the FY 87 budget, along with \$17M WTCV money.

Question. What equipment is currently used for "Initial Entry Training" of troops and why is this not sufficient?

General Harrison. Equipment currently being used for Initial Entry Training of troops includes nearly every item of equipment in the US Army inventory. All items on which personnel require training are included. This equipment will remain in place at mobilization and will continue to be used to train trainees. Equipment in the peacetime training base supports an average in-training load of 60,000. At mobilization training requirements increase by some 500% (to 300,000-350,000) and there is not nearly enough equipment to train these increased numbers.

Question. The equipment is to be used in peacetime for training of Army Reserve Training Divisions. In recent years, the Congress has been providing large appropriations for reserve component equipment. Why has none of this funding found its way to the training divisions?

General Harrison. Congressionally-directed appropriations for United States Army Reserve equipment totaled approximately \$350M in FY 86, not a large sum when compared to total requirements. Additional equipment has been provided the United States Army Reserve through the Army's normal distribution process. Warfighting priorities have resulted in an increase in equipment for Combat, Combat Support and Combat Service Support Units. The Army still has not completed equipping the above deployable units who have a higher priority than the USAR Training Divisions. Some items of equipment are being provided to the USAR Training Divisions as increased amounts of equipment are distributed to the USAR. These items are only a small portion of the total equipment required.

Question. The justifications state that the equipment will also be used to "train other military users in geographical proximity to USAR training units". What other military users are you referring to?

General Harrison. Equipment assigned to the various USAR units in a geographical area that is not required at that unit's home center for monthly training sessions can be stored and maintained at an Equipment Concentration Site (ECS). Once stored in the ECS, the equipment is available to any other military user in that area to borrow for training. The equipment being procured for the Mobilization Training Base/USAR Training Divisions could become so available. Additionally, this equipment, if located at a home center, could be available to other USAR, NG, or other service RC units located nearby on a loan basis.

The other military users referred to include USAR units, NG units, and units of the other military services located in the geographical area who have a need to borrow equipment with which to train due to their own equipment shortfall.

Question. On what basis did you decide which specific pieces of equipment to procure?

General Harrison. The process used to determine the specific items of equipment to procure included the conduct of Training Base Capacity Studies, analysis of equipment currently authorized in the USAR Training Divisions, and reviews of requirements for training equipment in each training discipline. Equipment shortages thus identified are either scheduled for resolution through the normal Army prioritization process for equipment distribution, or in cases where higher priorities preclude fill, through "piggy-backing" procurements on other scheduled equipment buys to minimize the unit cost. Our priorities within the MobilizationTraining Bases are first, to obtain necessary equipment to train those who will train others, then to obtain equipment to have available in the event of mobilization to train the increased number of soldiers being assessed. As final lists of items appropriate for procurement are developed, the lists receive a further review to insure that the goal of improved readiness is in fact being achieved.

Question. Why, for example, are you buying 12 new 155mm self-propelled howitzers when these weapons are just entering a major modification program?

General Harrison. The 155mm self-propelled howitzer is one of the most significant shortages in the USAR Tng Divs (15 auth; 3 on hand); however, the active force has no procurement scheduled for additional 155mm howitzers. Rather, on-hand equipment will be improved through modifications. These items are procurable in FY 87 as part of a Foreign Military Sales contract approved by Congress; therefore, the weapons can be bought at the best possible price by scheduling procurement now. The howitzers will be bought unmodified and modified at a later date as the Army's other 155's in the active/reserve components are modified. The 155's were identified for procurement because there is a critical shortage of those weapons in the USAR Tng Divs; they were available for procurement in FY 87; and the Army equipment procurement program would not otherwise allow this shortage to be corrected.

Question. Why are you buying 120mm mortars and 105mm L119 howitzers when these have not yet even been procured for the active forces?

General Harrison. The procurement of the USAR Training Divisions is being combined with the procurement for active component and other reserve component units. A total of 412 120mm mortars and 184 L119 howitzers are being procured for deploying units use in FY 87 and FY 88. The additive training base requirement is for

159 120mm mortars and 8 105mm L119 howitzers. It is necessary to provide these weapons to the training base in order to train trainers. Training cadre must be proficient on modernization items (e.g. 120mm mortars and L119 howitzers prior to M-day if they are to adequately train trainees on the use of these weapons. This combined procurement action insures that the necessary items are obtained at the most favorable price.

[CLERK'S NOTE.—End of questions submitted by Mr. Chappell.]

Mr. CHAPPELL. I believe that completes the hearing.

Are there other questions?

Mr. Miller, do you have a question?

### M1 TANK ENGINE

Mr. MILLER. Just one question, Mr. Chairman.

General, I am not sure whether you have covered this in your statement, but we hear reports about the fact that the M1 tank uses the turbine engine which produces a very high temperature exhaust, and consequently one M1 could not even pull another tank, and troops could not get behind it.

Could you comment on what has been done to help solve that problem?

General HARRISON. We are asking for in the 1987 budget dollars to start advanced procurement for a recovery vehicle that will pull the M1A1 tank, a recovery vehicle not pulling it with another tank. That should alleviate the problem of the turbine and the troops getting behind it, the situation you described.

Mr. MILLER. If you have a special vehicle for pulling M1A1, then that solves that problem. But how about the troops walking behind it with that intense heat; what has been done there?

General HARRISON. As far as anything to change that heat from the trubine engine on the M1 tank, we do not have anything right now to correct that.

The exhaust vents do point up, though, which should alleviate the problem of coming right down on the soldiers or should help a little bit. That modification has been in being for a while.

Colonel HOLEMAN. That problem has been overemphasized. It is not as significant as some media reports say.

Mr. MILLER. At the present time, are the tanks being modified in order to drive that exhaust up 90 degrees, so that it does go up and away from the troops who attempt to follow the tank?

Colonel HOLEMAN. It is vented up 45 degrees; there is still a problem. A dismounted soldier would probably not want to walk behind an M1. You probably wouldn't want to walk 30 miles an hour anyway.

Mr. MILLER. Thank you.

Mr. CHAPPELL. Gentlemen, thank you very much for very fine testimony.

We stand adjourned until 1:30 this afternoon.

General HARRISON. Thank you, sir. It has been a pleasure to be here. Thank you for your attention.

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WEDNESDAY, MARCH 12, 1986.

# AMMUNITION PROCUREMENT, ARMY

## WITNESSES

**MAJ. GENERAL ROBERT F. MOLINELLI, USA, DIRECTOR OF COMBAT SUPPORT SYSTEMS, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT AND ACQUISITION**

**BRIG. GENERAL GUY P. BOWEN, USA, DEPUTY EXECUTIVE DIRECTOR FOR CONVENTIONAL AMMUNITION, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT AND ACQUISITION**

**JOE BYRON, CHIEF, DEVELOPMENT, ACQUISITION AND BUDGET TEAM, MUNITIONS DIVISION, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT AND ACQUISITION**

## OPENING STATEMENT

Mr. CHAPPELL. The committee will please come to order.

Pursuant to a motion made and duly passed earlier, this session is in executive session because of the classified nature of the material to be discussed.

This afternoon the committee considers the Procurement of Ammunition, Army appropriation. The appropriation funds a large variety of end items, including small arms, mortar ammunition, tank ammunition, artillery ammunition, fuzes, and propelling charges.

It also funds the modernization and expansion of ammunition production facilities and the establishment of such facilities for new ammunition end items.

The fiscal year 1987 budget is $2.254 billion, and decrease of $120.8 million from the $2.375 billion appropriated in fiscal year 1986 after the Gramm-Rudman-Hollings sequestration.

Major items in the fiscal year 1986 budget include the mortar ammunition, the M483 Improved Conventional Munition, 120-millimeter tank ammunition, and the Light Anti-armor Weapon.

The principal witness is Major General Robert F. Molinelli, Director of Combat Support Systems, Office of the Deputy Chief of Staff for Research, Development and Acquisition.

General Molinelli, your statement will be made part of the record at this point. In the interest of time, please briefly summarize your statement, and then we will proceed to questions.

[Slide follows:]

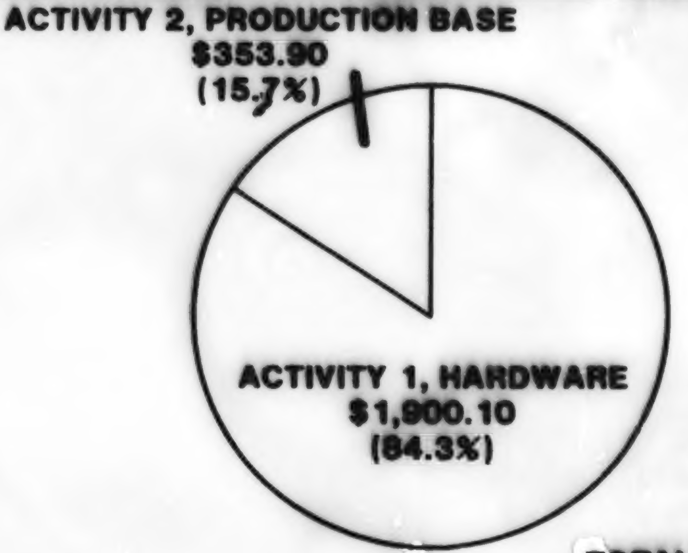
General MOLINELLI. I have about a one-minute summarization I will provide, and before I do that, I would like to introduce Brigadier General Guy Bowen, Deputy Executive Director for Conventional Ammunition. And to my left is the Chief of my Development Acquisition and Budget Team, Joe Byron.

We have submitted a statement for the record, but I will take about 60 seconds here to summarize the FY 1987 ammunition program.

The Procurement of Ammunition, Army appropriation is divided into two parts.

[Slide follows:]

# FY87 PROCUREMENT OF AMMUNITION, ARMY
## ($ IN MILLIONS)



TOTAL: $2,254.0 (100%)

321

General MOLINELLI. Activity 1—give me slide one, please—Activity 1 is hardware and Activity 2 is production base.

Our fiscal year 1987 request totals $2,254.0 million allocated to the two activities you see there. This total is a decrease of $243.2 million from our fiscal year 1986 appropriation.

In fiscal year 1987, the program results in a negative real growth between fiscal year 1986 and fiscal year 1987. It fails to maintain a warm production base for all the items, and supports only minimum strac training ammunition requirements.

Ammunition's sustainability has been severely degraded by decrements to Army's total obligation authority from the POM to the budget for fiscal year 1987. The fiscal year 1987 request is 26 percent less than the fiscal year 1987 column that you saw in the 1986 budget submit.

Mr. CHAPPELL. General, is this the budget you submitted to OMB?

General MOLINELLI. Yes, sir.

Mr. CHAPPELL. Was it submitted to the Department of Defense?

General MOLINELLI. This is the budget that we submitted and settled upon coming out of the Department of Defense, FY 1987 budget hearings.

Mr. CHAPPELL. Is this the one you sent back to the Secretary of Defense?

General MOLINELLI. No, sir, it is not.

Mr. CHAPPELL. Thank you.

General MOLINELLI. The fiscal year 1987 request is 9.7 percent less than the fiscal year 1986 appropriation.

[Slide follows:]

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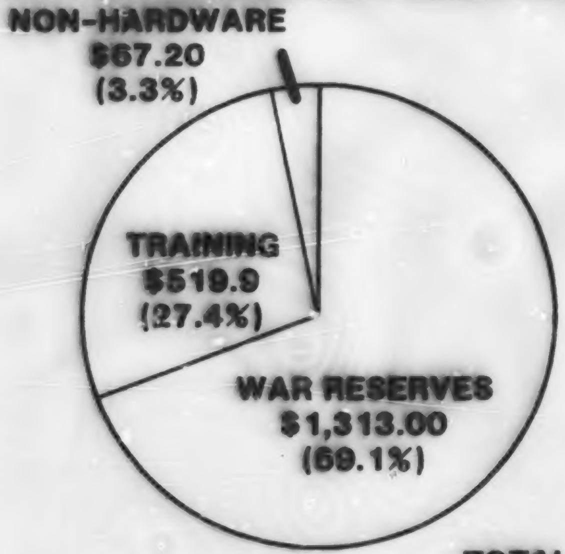
# FY87 AMMUNITION ACTIVITY 1 BY MAJOR ELEMENT
## ($ IN MILLIONS)



TOTAL: $1,900.10 (100%)

General **Molinelli**. Second slide, please. The Activity 1 provides for the procurement of ammunition to build war reserve stocks toward the authorized acquisition objectives, to provide for worldwide training consumption and provide for support items, nonhardware, such as components for renovation and ammunition peculiar equipment.

[Slide follows:]

# TRAINING AMMUNITION
## ($ IN MILLIONS)

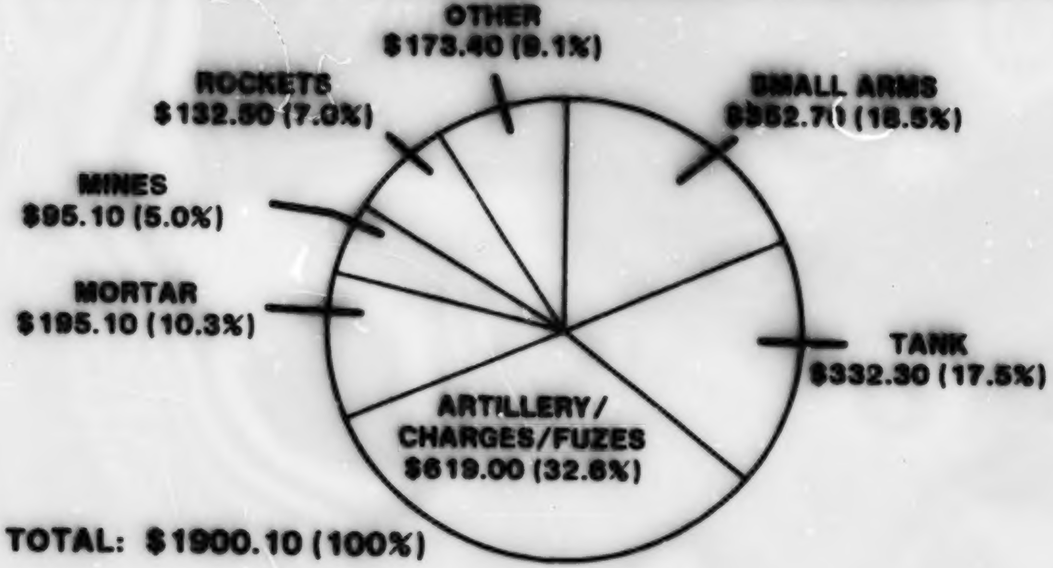
---

| | FY 85 | FY 86 | FY 87 | FY 88 |
|---|---|---|---|---|
| **TRAINING UNIQUE** | 344.0 | 417.4 | 346.7 | 465.6 |
| **SERVICE ROUNDS** | 113.0 | 172.6 | 173.2 | 166.7 |
| **TOTAL FUNDED** | 457.0 | 590.0 | 519.9 | 632.3 |

General **Molinelli**. Training ammunition includes items used only for training, that is, "training unique" such as simulators and service ammunition which is used for training purposes.

[Slide follows:]

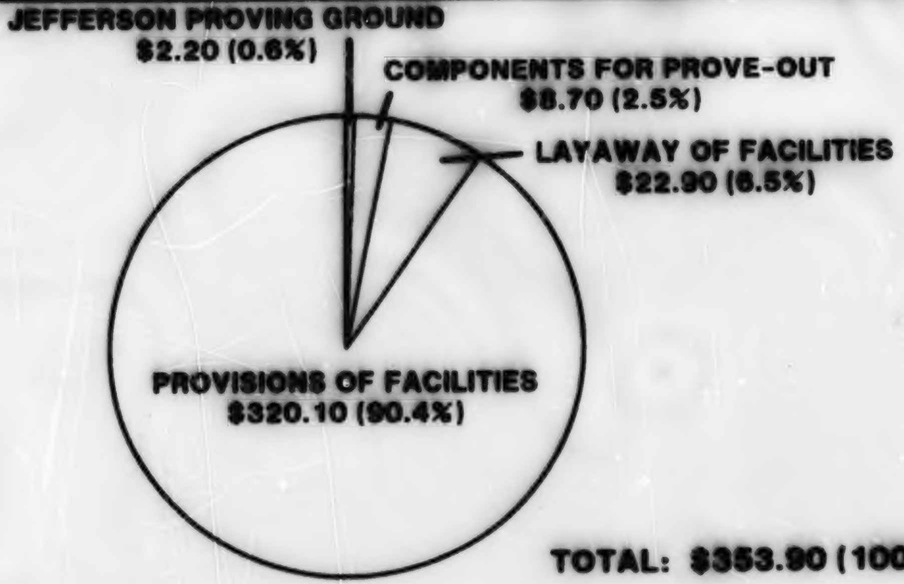
# FY87 AMMUNITION ACTIVITY 1 BY CATEGORY
# ($ IN MILLIONS)



General **Molinelli**. We buy a wide variety of ammunition to be able to meet the Army's various needs. This slide shows a broad category breakout by ammunition type. Each segement in this representation includes both training and war reserve ammunition.

[Slide follows:]

# FY87 AMMUNITION ACTIVITY 2 BY BUDGET LINE
## ($ IN MILLIONS)

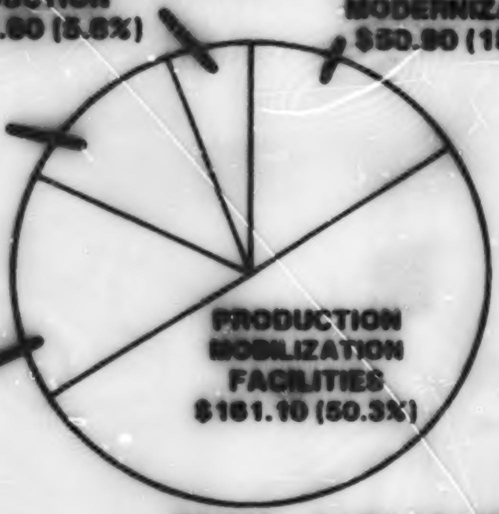


TOTAL: $353.90 (100%)

General MOLINELLI. Activity 2 includes those monies needed to maintain the United States production base in order to be able to meet peacetime requirements and to facilitate expansion to a wartime footing, if necessary.

[Slide follows:]

# FY87 PROVISION OF INDUSTRIAL FACILITIES
## ($ IN MILLIONS)



TOTAL: $320.10 (100%)

General **Molinelli**. The biggest piece of the activity 2 pie provides for the Provisioning of the Industrial Facilities which are the heart of our capability to produce ammunition. This slide shows a breakdown of how those funds would be used if appropriated.

[Slide follows:]

# AMMUNITION OVERVIEW FY 1987 BUDGET

- FY 87 AMMUNITION BUDGET REQUEST
  - $2,254.0 MILLION ($1900.) HARDWARE + $353.9 PRODUCTION BASE)
  - FY 87 REQUEST REPRESENTS A 9.7% DECREASE FROM THE FY 86 APPROPRIATION ($2254.0 VS $2497.2)

- INCREASES READINESS
  - PROVIDES FUNDS FOR TRAINING AMMUNITION
  - PROVIDES WAR RESERVE STOCKS
  - CONTAINS FUNDS FOR SMART MUNITIONS
  - FY 87 COPPERHEAD FUNDS LIMITED - WON'T ALLOW 2ND SOURCE
  - MODERNIZATION/EXPANSION/MAINTENANCE OF THE PRODUCTION BASE

- BALANCED PROGRAM
  - AVAILABLE FUNDING
    - BALANCE MIX OF WAR RESERVE/TRAINING AMMO AND PRODUCTION BASE SUPPORT
    - MAINTAINS WARM PRODUCTION BASE OF KEY ITEMS
  - PROCUREMENT OF BOTH IMPROVED CONVENTIONAL MUNITIONS AND SMART MUNITIONS

General **MOLINELLI**. In summary, the Army's fiscal year 1987 budget request provides for training and war reserve ammunition, for smart and standard munitions, for production at government and contractor facilities and for parts for repair as well as new rounds. In short, despite a request that is 9.7 percent below last year's appropriation, which will obviously affect certain programs, we believe the Army's 1987 budget request represents a balanced program which meets our needs within available funding.

Mr. Chairman, that concludes my summary.

[The statement of General Molinelli follows:]

STATEMENT BY MAJOR GENERAL ROBERT F. MOLINELLI, USA

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

IT IS A PLEASURE TO APPEAR BEFORE THIS SUBCOMMITTEE TODAY TO DISCUSS THE ARMY'S AMMUNITION PROGRAM.

THE FISCAL YEAR 1987 BUDGET CONTAINS $2,254.0 MILLION FOR PROCUREMENT OF AMMUNITION HARDWARE AND SUPPORT OF THE AMMUNITION PRODUCTION BASE. THIS IS A DECREASE OF $243.2 MILLION FROM OUR FY 1986 APPROPRIATION. COMPARISON OF OUR FY 1987 REQUEST WITH PRIOR YEAR APPROPRIATED PROGRAMS IS AS FOLLOWS:

| FY84 | FY85 | FY86 | FY87 |
|---|---|---|---|
| $1980.1M | $2500.3M | $2497.2M | $2254.0M |

THE FIRST THING YOU WILL OBVIOUSLY NOTICE IS THAT OUR APPROPRIATED PROGRAMS HAVE DECLINED SINCE 1985. SPECIFICALLY THE $243 MILLION LESS IN FISCAL YEAR 1987 IS A RESULT OF THE ARMY'S TOTAL OBLIGATION AUTHORITY FOR PLANNING PURPOSES BEING REDUCED LAST YEAR WHEN WE PREPARED THIS BUDGET SUBMISSION. THE REDUCTION IN PROCUREMENT OF AMMUNITION, ARMY IS APPROPRIATE WHEN COMPARED WITH THE RESEARCH, DEVELOPMENT AND OTHER PROCUREMENT PROGRAMS.

BEFORE DISCUSSING THIS YEAR'S BUDGET, I WOULD LIKE TO BRIEFLY DESCRIBE HOW THE ARMY DETERMINES ITS AMMUNITION BUDGET.

THE ARMY NEEDS AMMUNITION FOR BOTH WAR RESERVE AND TRAINING. WAR RESERVE REQUIREMENTS ARE BASED ON COMPUTER CALCULATIONS OF AMMUNITION CONSUMPTION BY APPROPRIATE FORCE STRUCTURES DURING DIFFERENT CONTINGENCY SCENARIOS. PRECISE QUANTITIES OF AMMUNITION NEEDED FOR TRAINING ARE DETERMINED FROM CAREFULLY STRUCTURED TRAINING STRATEGIES REQUIRED TO ATTAIN AND MAINTAIN READINESS. THE TOTAL BUDGET IS THEN FORMED FROM THE COST OF THAT AMMUNITION REQUIRED FOR WAR RESERVE CONTINGENCIES AND THAT AMMUNITION REQUIRED TO SUPPORT HIGH PRIORITY TRAINING FOR OUR SOLDIERS. A CHART SHOWING THE PRIORITY OF FILL OF THE ACQUISITION OBJECTIVE IS LOCATED ON PAGE 22.

THE ARMY CONTINUES TO EMPHASIZE BUILDUP OF WAR RESERVE INVENTORIES TO SUPPORT CONTINGENCIES AND MAINTENANCE OF THE ACTIVE BASE UNTIL MOBILIZATION ACTIONS ENERGIZE AND EXPAND THE TOTAL BASE TO PROVIDE THE NECESSARY SUSTAINED SUPPORT.

AT THIS TIME I WOULD LIKE TO ADDRESS AMMUNITION DAYS OF SUPPLY IN GENERIC TERMS. BEGINNING WITH THIS BUDGET SUBMISSION, THE ARMY HAS ADOPTED A NEW METHODOLOGY FOR CALCULATING DAYS OF SUPPLY. ALL CURRENT RESUPPLY RATES FOR THE FY 87 BUDGET ARE BASED ON MODELING WHICH ASSUMES THE AUTHORIZED INITIAL ISSUE QUANTITY (AIIQ) IS NOT IN THE CONSUMPTION RATE, BUT RATHER IS ISSUED TO EACH WEAPON SYSTEM. WHEREAS IN THE PAST THE ARMY COUNTED ALL AMMUNITION IN THE INVENTORY WHEN DETERMINING THE NUMBER OF DAYS OF SUPPLY OF A GIVEN ROUND, THE NEW PROCEDURE

EXCLUDES FROM THE CALCULATION ALL AMMUNITION IN THE INVENTORY THAT "PROVIDES EACH DEPLOYABLE WEAPON SYSTEM AND UNIT THE CAPABILITY TO PERFORM ITS TOE COMBAT MISSION." ESSENTIALLY, THE NEW CRITERIA EXCLUDES FROM CONSIDERATION THE EQUIVALENT OF AN INITIAL LOADOUT OF AMMUNITION, WHICH IN THE CASE OF A TANK, IS THE AMMUNITION THAT CAN BE STORED ON BOARD THE TANK. THE PREVIOUS METHODOLOGY WAS BASED ON EACH WEAPON SYSTEM ENTERING THE WAR ON D-DAY WITH ONLY THE EXACT AMOUNT OF AMMUNITION NECESSARY FOR DAILY CONSUMPTION. THIS CLEARLY VIOLATES PRINCIPLES OF GROUND COMBAT ESPOUSED IN U.S. ARMY DOCTRINE AND EVEN IN THE INFORMATION AVAILABLE CONCERNING SOVIET DOCTRINE AND PLANS. DURING THE QUESTION PERIOD, I WILL ADDRESS IN DETAIL THE ACTUAL DAYS OF SUPPLY ACHIEVED UNDER THE NEW METHODOLOGY VERSUS THE DAYS OF SUPPLY THAT HAD PREVIOUSLY BEEN PROVIDED TO CONGRESSIONAL COMMITTEES, BASED ON THE OLD METHODOLOGY.

THE FY 1987 AMMUNITION BUDGET REQUEST CONSISTS OF $1,900.1 MILLION FOR HARDWARE AND $353.9 MILLION FOR PRODUCTION BASE SUPPORT.

AMMUNITION HARDWARE:

AMMUNITION HARDWARE PROVIDES FOR PROCUREMENT OF MODERN HARDWARE, BUILDUP OF WAR RESERVE STOCKS TOWARD THE AUTHORIZED ACQUISITION OBJECTIVES, AND WORLDWIDE TRAINING CONSUMPTION THROUGH THE FY 1987 FUNDED DELIVERY PERIOD. THE HARDWARE REQUEST IS BROKEN OUT INTO THE FOLLOWING CATEGORIES:

| CATEGORY | $ MILLIONS |
|---|---|
| TRAINING | $ 519.9 |
| WAR RESERVE | 1,313.0 |
| NON-HARDWARE | 67.2 |
| | $ 1,900.1 |

WAR RESERVE FUNDING IS 69.1% OF THE AMMUNITION HARDWARE BUDGET REQUEST, WHEREAS FUNDING IN SUPPORT OF TRAINING IS 27.4%. I WOULD LIKE TO POINT OUT THAT THE NON-HARDWARE REQUEST IS FOR RENOVATION OF EXISTING AMMUNITION STOCKPILING OF EXPLOSIVES FOR WAR RESERVE MUNITIONS, INITIAL SPARES AND REPLENISHMENT SPARES WHICH INCLUDES WEAPONS ACCESS DELAY SYSTEM (WADS) AND PERMISSIVE ACTION LINK (PAL) REPAIR PARTS AND NUCLEAR WEAPON ACCESSORY KITS.

THE HARDWARE REQUEST BROKEN DOWN BY TYPE IS 25% FOR ARTILLERY, 19% FOR SMALL ARMS, 18% FOR TANK, 7% FOR PROPELLING CHARGES AND FUZES, 7% FOR ROCKETS, 10% FOR MORTARS, AND 5% FOR MINES. THE REMAINING 9% IS MISCELLANEOUS (ATOMIC MATERIEL, NON-HARDWARE, ETC.).

| % | TYPE OF AMMO | $ MILLIONS |
|---|---|---|
| 25 | ARTILLERY | $ 478.5 |
| 19 | SMALL ARMS | 352.7 |
| 18 | TANK | 332.3 |
| 7 | PROP CHG & FUZES | 140.5 |
| 7 | ROCKETS | 132.5 |
| 10 | MORTARS | 195.1 |
| 5 | MINES/COUNTERMINES | 97.2 |
| 9 | MISC | 171.3 |
|  |  | $ 1900.1 |

NOW LET'S ADDRESS EACH ONE OF THESE "TYPES OF AMMUNITION" BRIEFLY.

o ARTILLERY

ALMOST ALL OF THE $478.5 MILLION IS ESSENTIALLY TO PROVIDE A WAR RESERVE BUILDUP OF NEW, MODERNIZED 155MM ARTILLERY ROUNDS.

THE 155MM, HE, ICM, DP (HIGH EXPLOSIVE, IMPROVED CONVENTIONAL MUNITION, DUAL-PURPOSE) PROJECTILE, AT $173.0 MILLION ACCOUNTS FOR 36% OF THE FUNDING REQUESTED FOR ARTILLERY AMMUNITION. THIS IS THE IMPROVED ROUND USED AGAINST PERSONNEL, VEHICLES, AND LIGHT ARMOR.

$31.6 MILLION, 7% OF THE ARTILLERY BUDGET, IS REQUESTED FOR THE 155MM BASEBLEED. THIS HIGH EXPLOSIVE (HE) IMPROVED

CONVENTIONAL MUNITIONS (ICM) PROJECTILE IS A DUAL PURPOSE (DP) ANTI-ARMOR/ANTI-PERSONNEL ROUND. THIS ROUND DIFFERS FROM THE BASIC ICM ROUND IN THAT IT HAS EXTENDED RANGE CAPABILITIES.

$117.3 MILLION IS REQUESTED FOR THE 155MM RAAMS (REMOTE ANTI-ARMOR MINE SYSTEM) PROJECTILE. $33.9 MILLION IS NEEDED FOR THE 155MM ADAM OR "AREA DENIAL ARTILLERY MUNITION" PROJECTILE. THESE TWO ARTILLERY ROUNDS CAN LAY DOWN A SMALL MINEFIELD TARGETED EITHER AGAINST PERSONNEL OR ARMORED TARGETS, OR AGAINST BOTH.

$60.6 MILLION IS REQUESTED FOR THE 155MM BINARY MUNITION PROJECTILE. BINARY CHEMICAL MUNITIONS PROVIDE FOR SEPARATION OF TWO NONLETHAL COMPONENTS UNTIL THE ROUND IS FIRED OR LAUNCHED. MIXING OF THE SEPARATE COMPONENTS TO PRODUCE A LETHAL CHEMICAL AGENT OCCURS WHILE THE PROJECTILE IS IN FLIGHT TO THE TARGET.

$13.5 MILLION IS REQUESTED FOR THE 155MM, WP SMOKE SCREENING ROUND. THE WHITE PHOSPHOROUS PROVIDES 5-10 MINUTES OF GROUND SCREENING SMOKE.

$37.3 MILLION IS REQUESTED FOR THE 8-INCH ROCKET ASSISTED PROJECTILE (RAP). THE M650 RAP IS AN EXTENDED RANGE PROJECTILE PRIMARILY FOR USE WITH THE 8-INCH SELF PROPELLED HOWITZER.

o SMALL ARMS

$83.6 MILLION IS REQUESTED FOR 5.56MM AMMUNITION. THIS INCLUDES AMMO FOR THE NEW SQUAD AUTOMATIC WEAPON SYSTEM (SAW) AND THE M16A2 RIFLE. THESE 5.56MM BULLETS HAVE A STEEL CONICAL INSERT IN THE OGIVE WHICH RESULTS IN AN INCREASED RANGE. THE ASSOCIATED TRACER ROUND PROVIDES INCREASED DAYLIGHT SIGNATURE AND RANGE.

$74.2 MILLION IS FOR 25MM AMMUNITION IN 2 CONFIGURATIONS: AN HE INCENDIARY TRACER, AND A TARGET PRACTICE TRACER.

$45.4 MILLION IS REQUESTED FOR 40MM HIGH EXPLOSIVE DUAL PURPOSE (HEDP) HIGH VELOCITY AMMUNITION AND THE 40MM SMOKE AND TRAINING ROUNDS USED IN THE MK19 MACHINE GUN AND THE M203 GRENADE LAUNCHERS ATTACHED TO THE M16/M16A1 RIFLE.

o TANK

THE FUNDS ASSOCIATED WITH 105MM TANK WAR RESERVE AND TRAINING AMMUNITION REQUIREMENTS ARE FOR ROUNDS FIRED FROM THE MAIN GUN CANNON MOUNTED ON TANK MODELS M1, M60, M60A1, M60A3, AND M48A5. THE BUDGET ALSO INCLUDES AMMUNITION FOR THE 120MM GUN SYSTEM ON THE M1A1 ABRAMS TANK. THE FUNDS FOR WAR RESERVE PROCURE ARMOR-PIERCING, FIN-STABILIZED, DISCARDING SABOT WITH TRACER (APFSDS-T) AND HIGH EXPLOSIVE ANTI-TANK, MULTI-PURPOSE, TRACER (HEAT-MP-T) ROUNDS. THE APFSDS-T CARTRIDGES, WHICH HAVE INCREASED CAPABILITY AND RELIABILITY, WILL REPLACE THE OLDER

VERSION OF ARMOR-PIERCING, DISCARDING-SABOT AMMUNITION. APFSDS ROUNDS ARE INTENDED FOR USE AGAINST ARMOR TARGETS. THE HEAT-MP-T ROUNDS ARE EFFECTIVE AGAINST BOTH ARMOR AND FORTIFICATIONS. THE TRAINING ROUNDS ARE NEEDED TO SUPPORT ANNUAL TANK QUALIFICATION/FAMILIARIZATION FIRING.

- PROPELLING CHARGES AND FUZES

PROPELLING CHARGES. $117.6 MILLION IS REQUESTED FOR 155MM AND 8-INCH PROPELLING CHARGES IN SUPPORT OF WAR RESERVE BUILDUP AND TRAINING REQUIREMENTS.

FUZES. MECHANICAL TIME FUZES ARE REQUIRED TO BALANCE ON-HAND PROJECTILE ASSETS AT THE END OF THE FY 1987 FUNDED DELIVERY PERIOD. THE MECHANICAL TIME FUZE PROGRAM SUPPORTS THE NEW ICM/ADAM/RAAMS FAMILIES OF MUNITIONS.

- ROCKETS

THE FUNDS REQUESTED SUPPORT PLANNED PROCUREMENT OF BOTH THE HYDRA 70 (2.75 INCH) AND THE LIGHT WEIGHT MULTI-PURPOSE ROCKET SYSTEMS. ALSO INCLUDED ARE PROCUREMENT PROGRAMS FOR THE TRAINING ROUNDS ASSOCIATED WITH EACH OF THESE SYSTEMS.

- MORTARS

PLANNED PROCUREMENT OF THE IMPROVED 81MM CARTRIDGE IS FOR

THE HIGH EXPLOSIVE (HE), ILLUMINATION, SMOKE ROUNDS AND 1/10 RANGE TRAINING ROUND. THIS IMPROVED AMMUNITION IS FIRED FROM THE UNITED KINGDOM MORTAR WHICH IS SMOOTHBORE AND PROVIDES INCREASED RANGE, LETHALITY, RATE OF FIRE, AND STABILITY OVER THE U.S. M29A1 MORTAR.

PROCUREMENT OF 4.2" MORTAR AMMUNITION IS FOR HIGH EXPLOSIVE ROUNDS WHICH WILL PROVIDE AMMUNITION DURING THE TRANSITION TO THE ARMY'S NEW 120MM MORTAR.

THE FY 1987 BUDGET INCLUDES INITIAL PROCUREMENT FOR THE 120MM HE, ILLUMINATION, AND SMOKE MORTAR ROUNDS. THIS AMMUNITION WILL SUPPORT THE ARMY'S NEW HEAVY MORTAR SYSTEM, PROVIDING INCREASED RANGE AND LETHALITY.

### o MINES/COUNTERMINES

THE FY 1987 REQUEST INCLUDES THE MODULAR PACK MINE SYSTEM (MOPMS), AND VOLCANO -- A HELICOPTER OR GROUND DISPENSED MINE SYSTEM. ALL ARE SCATTERABLE MINE SYSTEMS AND CONTAIN BOTH ANTIPERSONNEL AND ANTITANK MINES. ALSO INCLUDED ARE THE TRAINING MINES TO SUPPORT TRAINING ON THE GEMSS AND VOLCANO DISPENSING SYSTEMS. IN ADDITION, THIS FY 1987 REQUEST INCLUDES THE MINE CLEARING LINE CHARGE (MICLIC) SYSTEM, A ROCKET DEVICE DESIGNED TO BREACH PATHS THROUGH ENEMY MINEFIELDS AND OBSTACLES.

o **MISCELLANEOUS**

**NUCLEAR MATERIEL**

$14.3 MILLION IS REQUESTED TO PROVIDE NUCLEAR WEAPONS SUPPORT MATERIEL, AND INITIAL PROCUREMENT FOR 37 TRAINERS FOR THE 155MM NUCLEAR PROJECTILES.

**NON-HARDWARE**

EXPLOSIVES AND PROPELLANTS AT $35.0 MILLION, NITROGUANIDINE AT $23.2 MILLION AND COMPONENTS FOR RENOVATION AT $20.3 MILLION ARE THE MAJOR PROGRAMS IN THIS CATEGORY. FUNDING FOR EXPLOSIVES AND PROPELLANTS IS REQUIRED TO ESTABLISH A STOCKPILE TO MEET SURGE REQUIREMENTS DURING MOBILIZATION, AND/OR TO ALLOW CONTINUATION OF AMMUNITION PRODUCTION IN THE EVENT OF THE CATASTROPHIC FAILURE OF AN EXPLOSIVES/PROPELLANT LINE. COMPONENTS FOR RENOVATION FUNDING PROVIDES FOR PROCUREMENT OF AMMUNITION COMPONENTS REQUIRED FOR RENOVATION OF UNSERVICEABLE ASSETS CURRENTLY IN THE INVENTORY. NITROGUANIDINE IS AN EXPLOSIVE PROPELLANT REQUIRED FOR USE IN PROPELLANT CHARGES AND 105MM TANK TRAINING AMMUNITION.

**AMMUNITION PRODUCTION BASE**

THE AMMUNITION PRODUCTION BASE FY 1987 PROGRAM OF $353.9 MILLION HAS AS ITS PRINCIPAL THRUST THE CONTINUATION OF PRIOR YEAR INITIATIVES. IN ACCORDANCE WITH DEPARTMENT OF DEFENSE GUIDANCE, THE ARMY IS EMPHASIZING FINANCING THOSE PRODUCTION BASE PROJECTS NEEDED TO MEET PEACETIME

PRODUCTION REQUIREMENTS. IN ADDITION $161.1 MILLION IS INCLUDED TO PARTIALLY REDRESS SHORTFALLS IN MOBILIZATION FACILITIES. THE FOLLOWING SUMMARIZES OUR AMMUNITION PRODUCTION BASE REQUEST.

| | MILLIONS OF DOLLARS |
|---|---|
| PROVISION OF INDUSTRIAL FACILITIES | $ 159.0 |
| LAYAWAY OF INDUSTRIAL FACILITIES | 22.9 |
| COMPONENTS FOR PROVE-OUT | 8.7 |
| JEFFERSON PROVING GROUND MODERNIZATION | 2.2 |
| PRODUCTION BASE MODERNIZATION | 161.1 |
| TOTAL | $ 353.9 |

THE FY 1987 BUDGET INCLUDES $38.9 MILLION TO SUPPORT PRODUCTION AND REPLACE EQUIPMENT AT 17 ACTIVE AMMUNITION PRODUCTION PLANTS.

A TOTAL OF $120.1 MILLION IS REQUESTED FOR INITIAL PRODUCTION FACILITIES AND MODERNIZATION AND EXPANSION PROJECTS, WHICH ESTABLISH THE PRODUCTION BASE CAPABILITY TO PRODUCE MODERNIZED AMMUNITION ITEMS. NEW PRODUCTION CAPABILITY IS BEING ESTABLISHED OR EXPANDED FOR THE 155MM XM864 BASE BLEED ROUND, RESEARCH DEPARTMENT EXPLOSIVE/HIGH MELT EXPLOSIVE (RDX/HMX) EXPLOSIVE AND PROPELLANT MANUFACTURING CAPABILITIES, AND 155MM M687 CHEMICAL MUNITIONS. THESE PROJECTS ARE NEEDED TO INTRODUCE THESE ITEMS INTO THE DOD INVENTORY TO INCREASE THE READINESS AND EFFECTIVENESS OF OUR COMBAT FORCES.

THREE PROJECTS TOTALING $38.6 MILLION PROVIDE FACILITIES FOR THE CHEMICAL COMPOUND DICHLORO WHICH IS THE PRECURSOR CHEMICAL FOR THE BINARY ROUND AND EXPAND METAL PARTS FACILITIES FOR THE 155MM ARTILLERY ROUND AND FOR THE AIR FORCE BIGEYE BOMB. TWO PROJECTS TOTALING $30.6 MILLION SUPPORT THE RDX/HMX MODERNIZATION/EXPANSION EFFORT. THE PROJECTS ARE AT HOLSTON AAP; ONE TO MODERNIZE THE FACILITY, LINE 10 WHICH PRODUCES COMPOSITIONS A-3, A-4, AND A-5 AT A COST OF $24.7 MILLION; THE SECOND, FOR $5.9 MILLION, IS FOR PRODUCTIVITY IMPROVEMENTS. $11.3 MILLION IS FOR EXPANSION OF THE 155MM XM864 BASE BLEED LOAD, ASSEMBLE AND PACK AND METAL PARTS FACILITY. $18.3 MILLION IS FOR MODERNIZATION OF THE STEAM TIE LINE AND ELECTRICAL DISTRIBUTION SYSTEM AT RADFORD AAP AND $3.1 MILLION IS TO UPGRADE THE 155MM STICK PROPELLANT CUTTING AND TAKEAWAY SYSTEM AT RADFORD AAP. $2.0 MILLION IS TO MODERNIZE THE EXISTING CENTRAL LABORATORY AT INDIANA AAP AND $16.2 MILLION IS FOR ENGINEERING DESIGN EFFORT FOR OUTYEAR PROJECTS.

THE $22.9 MILLION REQUESTED FOR LAYAWAY IS FOR THE PROTECTION AND PRESERVATION OF EQUIPMENT AND FACILITIES AT VARIOUS LOCATIONS WHICH ARE NO LONGER REQUIRED FOR ACTIVE PRODUCTION, BUT WHICH MUST BE RETAINED FOR FUTURE OR MOBILIZATION PRODUCTION.

$8.7 MILLION IS FOR COMPONENTS FOR PROVE-OUT AT VARIOUS FACILITIES. THIS PROVIDES FUNDS TO CHECK OUT COMPLETED

PRODUCTION FACILITIES TO ASSURE (1) THE MANUFACTURER IS CAPABLE OF PRODUCING AN ACCEPTABLE END PRODUCT, (2) THE MANUFACTURER'S WARRANTIES ARE MET, AND (3) THE FACILITY IS CAPABLE OF PRODUCING AT THE DESIGN RATE SPECIFIED. MODERNIZATION OF JEFFERSON PROVING GROUND TEST FACILITY ($2.2 MILLION) IS PART OF AN EFFORT TO MODERNIZE AND UPGRADE EXISTING TEST INSTRUMENTATION REQUIRED DURING PRODUCTION ACCEPTANCE TESTING ON ARMY AMMUNITION AND AMMUNITION COMPONENTS. INCLUDED IN THE $161.1 MILLION TO CORRECT MOBILIZATION DEFICIENCIES IS $42.5 MILLION TO MODERNIZE AND EXPAND COMPOSITION A, COMPOSITION B AND EXPLOSIVE LOADING DOCKS AT HOLSTON AAP. $58.3 MILLION IS TO ESTABLISH A 155MM XM215/216 STICK PROPELLANT CAPABILITY AT RADFORD AAP, $27.0 MILLION IS FOR A BLACK POWER FACILITY AT INDIANA, $10.6 MILLION IS FOR A SECOND SOURCE FOR THE 120MM COMBUSTIBLE CARTRIDGE CASE AT A CONTRACTOR FACILITY, AND $4.9 MILLION IS TO MODERNIZE TNT FACILITIES AT RADFORD AAP. THE PROGRAM ALSO INCLUDES $15.5 MILLION FOR OMNIBUS ENGINEERING DESIGN, $1.5 FOR M55 DETONATOR LOADER AND $.8 MILLION FOR A GAS DISTRIBUTION SYSTEM AT LOUISIANA AAP.

## HARDWARE SUMMARY

| ARTILLERY AMMUNITION | MILLIONS OF DOLLARS |
|---|---|
| PROJECTILE, 155MM, HE, ICM, (DP) | $173.0 |
| PROJECTILE, 155MM, HE, ADAM | 33.9 |
| PROJECTILE, 155MM, HE, RAAMS | 117.3 |
| PROJECTILE, 155MM, BASEBLEED, XM864 | 31.6 |
| PROJECTILE, 155MM, HE, COPPERHEAD | 8.2 |
| PROJECTILE, 155MM, WP, SMK SCREENING | 13.5 |
| CHEMICAL MUNITIONS | 60.6 |
| PROJECTILE, 8-INCH, HE, RAP | 37.3 |
| PRIMER, PERCUSSION | 2.0 |
| 14.5MM SUBCALIBER CARTRIDGE | 1.1 |
| TOTAL | $478.5 |

| SMALL ARMS AMMUNITION | MILLIONS OF DOLLARS |
|---|---|
| CARTRIDGE, 5.56MM, ALL TYPES | $ 83.6 |
| CARTRIDGE, 7.62MM, ALL TYPES | 87.6 |
| CALIBER .22, ALL TYPES | .7 |
| CALIBER .38, SPECIAL BALL WADCUTTER | .6 |
| CALIBER .45, ALL TYPES | .7 |
| CALIBER .50, ALL TYPES | 44.5 |
| CARTRIDGE, 20MM, ALL TYPES | 13.0 |
| CARTRIDGE, 30MM, ALL TYPES | 2.4 |
| CARTRIDGE, 25MM, ALL TYPES | 74.2 |
| CARTRIDGE, 40MM, ALL TYPES | 45.4 |
| TOTAL | $352.7 |

| TANK AMMUNITION | MILLIONS OF DOLLARS |
|---|---|
| CARTRIDGE, 105MM, DS-TP (DISCARDING SABOT-TARGET PRACTICE) | $ 41.6 (T) |
| CARTRIDGE, 105MM, APFSDS-T (ARMOR PIERCING FIN STABILIZED DISCARDING SABOT-TRACER) | 20.3 (WR) |
| CARTRIDGE, 105MM, HEAT (HIGH EXPLOSIVE ANTI-TANK) | 7.7 (WR) |
| CARTRIDGE, 120MM, TP-T | 38.8 (T) |
| CARTRIDGE, 120MM, TPCSDS-T (TARGET PRACTICE CONE STABILIZED DISCARDING SABOT-TRACER) | 104.9 (T) |
| CARTRIDGE, 120MM, APFSDS-T | 75.9 (WR) |
| CARTRIDGE, 120MM HEAT | 27.8 (WR) |
| GRENADE, SMOKE, SCREENING (RED PHOSPHOROUS) | 6.3 (WR/T) |
| GRENADE, SMOKE SCREENING (INFRA-RED) | 9.0 (WR) |
| TOTAL | $332.3 |

| | |
|---|---|
| (T) TRAINING AMMUNITION | ($188.8) |
| (WR) WAR RESERVE AMMUNITION | ($143.5) |

| PROPELLING CHARGES | MILLIONS OF DOLLARS |
|---|---|
| CHARGE, PROP, 155MM | $113.6 |
| CHARGE, PROP, 8-INCH | 4.0 |
| TOTAL | $117.6 |

**FUZES**

| | |
|---|---|
| FUZE, MECHANICAL TIME, SUPER QUICK | $ 22.9 |

**MORTAR AMMUNITION**

| | |
|---|---|
| CARTRIDGE, 81MM, IMPROVED (ILLUM) | $ 3.4 |
| CARTRIDGE, 81MM, IMPROVED (SMOKE) | 11.0 |
| CARTRIDGE, 81MM, IMPROVED (HE) | 91.3 |
| CARTRIDGE, 81MM, IMPROVED 1/10 RANGE (TNG) | 2.9 |
| CARTRIDGE, 4.2", HE WITHOUT FUZE | 22.0 |
| CARTRIDGE, 120MM HE W/MULTI-OPTION FUZE | 44.7 |
| CARTRIDGE, 120MM ILLUM | 5.5 |
| CARTRIDGE, 120MM SMOKE | 14.3 |
| | $195.1 |

**NUCLEAR MATERIEL**

| | |
|---|---|
| NUCLEAR WEAPONS SUPPORT MATERIAL | $ 2.6 |
| PROJECTILE 155MM NUCLEAR | 11.7 |
| | $14.3 |

| MINES/COUNTERMINES | MILLIONS OF DOLLARS |
|---|---|
| VOLCANO MINE, CANISTER | $ 31.6 |
| VOLCANO MINE, CANISTER, PRACTICE | 1.9 |
| MINE DRILL GEMSS M79 | .2 |
| MINE CLEARING LINE CHARGE (MICLIC) | 24.4 |
| MINE CLEARING LINE CHARGE (INERT) | .3 |
| ROCKET MOTOR | 13.3 |
| PURSUIT DETERRENT MUNITION | 2.1 |
| MODULAR PACK MINE SYSTEM (MOPMS) | 23.4 |
| TOTAL | $97.2 |

| ROCKETS | |
|---|---|
| LIGHT WEIGHT MULTI-PURPOSE SYSTEM | $ 82.5 |
| LIGHT WEIGHT MULTI-PURPOSE SYSTEM (TRAINER) | 2.5 |
| HYDRA 70 ROCKET (2.75 INCH), HE/PD | 44.8 |
| HYDRA 70 ROCKET, MULTI-PURPOSE SUB-MUNITION (PRACTICE) | 2.7 |
| TOTAL | $132.5 |

| OTHER AMMUNITION | MILLIONS OF DOLLARS |
|---|---|
| SIGNALS, ALL TYPES | $18.0 |
| DEMOLITION MUNITIONS | 13.8 |
| SIMULATORS, ALL TYPES | 4.3 |
| HAND GRENADES, ALL TYPES | 27.9 |
| AMMO 9WW/ELT | 1.6 |
| CARTRIDGE ACTIVATED DEVICES/ PERCUSSION ACTIVATED DEVICES | 2.5 |
| MARKSMANSHIP TRAINING UNIT AMMO | 0.7 |
| TOTAL | $68.8 |

| NON-HARDWARE | MILLIONS OF DOLLARS |
|---|---|
| EXPLOSIVES AND PROPELLANTS | $ 35.0 |
| COMPONENTS FOR SPECIAL TESTS | .4 |
| COMPONENTS FOR RENOVATION | 16.6 |
| SPARES AND REPAIR PARTS | 1.2 |
| WEAPON COMPONENTS IN SUPPORT OF AMMUNITION PROOF AND ACCEPTANCE TESTING | 3.3 |
| COMPONENTS FOR DCM | .7 |
| NITROGUANIDINE | 23.2 |
| AMMUNITION PECULIAR EQUIPMENT | 7.8 |
| TOTAL | $88.2 |
| HARDWARE TOTAL | $1900.1 |

## PRODUCTION BASE SUPPORT SUMMARY

| | MILLIONS OF DOLLARS |
|---|---|
| PROVISION OF INDUSTRIAL FACILITIES | $159.0 |
| LAYAWAY OF INDUSTRIAL FACILITIES | 22.9 |
| COMPONENTS FOR PROVE-OUT | 8.7 |
| JEFFERSON PROVING GROUND MODERNIZATION | 2.2 |
| PRODUCTION BASE MODERNIZATION | 161.1 |
| PROD BASE SUPPORT TOTAL | $353.9 |

## AMMUNITION PRIORITY

Mr. **CHAPPELL**. General, was the budget submitted to the Secretary of Defense lower or higher than this budget?

General **MOLINELLI**. Higher than what you are seeing here now.

Mr. **CHAPPELL**. How much higher?

Mr. **BYRON**. The program was increased by approximately $92 million from the original request that went up there.

General **MOLINELLI**. That is correct. We did get a plus up in that, Mr. Chairman. It was increased.

Mr. **BYRON**. Sir, the budget that we submitted to the Secretary of Defense was increased in the review cycle. We received a $92 million increase over and above what we requested.

Mr. **CHAPPELL**. This budget is higher than the one you requested?

Mr. **BYRON**. That is correct.

Mr. **CHAPPELL**. You feel this is satisfactory, adequate?

General **MOLINELLI**. Mr. Chairman, I think it is not satisfactory. I don't believe that we are making a sufficient investment in ammunition, and then, of course, I must honestly state I am somewhat biased because I am the Army's ammunition manager.

When I look at the total reductions that the Army has taken in total obligational authority, the Army took a 9.9 percent decrease from last spring until last September in our planning and programming figures for the Army budget.

Ammunition took a 9.7 percent decrease, so we actually have in the ammunition account a little bit more than the total Army decrease in total obligational authority.

I am pro-ammunition and I would like to spend more money there, but looking at it across the Army's programs we have a balanced program in consonance with the funding that is available to the Army.

Mr. **CHAPPELL**. Do you think that the ammunition procurement is given proper priority in this fiscal year budget given the overall budget constraints?

I am asking for your professional opinion.

General **MOLINELLI**. The reductions that we have seen in the procurement account, in consonance with that, I would say that the ammunition program is appropriate for the reduced obligational authority that the Army has. We have seen some dramatic reductions in the Army's total procurement account.

Mr. **CHAPPELL**. Is it in your personal and professional opinion adequate for the real requirements of the Army?

General **MOLINELLI**. It will not buy a sufficient stock level to meet the requirements. This is true, throughout the Army.

Mr. **CHAPPELL**. I understand that. I am trying to stay right on ammunition.

The only fiscal year 1987 increase in Army procurement is for Other Procurement, Army, which increases $1.15 billion.

Since you also have jurisdiction for Other Procurement, how do you justify this large increase when ammunition is actually declining?

General **MOLINELLI**. The increase in Other Procurement Army is in the information management area, and it was weighted by such factors as the acquisition of mobile subscriber equipment, comput-

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ers, and the Army's desire to provide these electronic systems into the Army to reduce some of our manpower requirements. Actually, that is on a positive build.

Mr. **Chappell.** Which is more important: ammunition or these things you just describe?

General **Molinelli.** They are both equally important.

Mr. **Chappell.** If they are equally important, why didn't they get equal cuts?

General **Molinelli.** They both have relative importance. Priority wise, we have higher priorities on OPA, in some cases than we do on ammunition.

I must also state, in some cases in OPA, in the Combat Service Support Arena, we have decremented those programs to buy the increase in information management systems. We see this as very necessary, as we come on with our new weapons systems, to handle information and to handle intelligence aspects of the war and to reduce the number of personnel that are required in those various areas.

Mr. **Chappell.** Well, the R&D budget is increased by 22 percent. Do you think that is a proper adjustment of assets or need?

Twenty-two percent in R&D and steadily declining expenditure in ammunitions over the past three years; does that make sense to you?

General **Molinelli.** I don't have a problem with the R&D budget increase; although it sounds like a large increase when you look at it, it is a rather small piece of the total Army budget. And, yes, I do believe that we have a requirement to make an increased investment in research and development.

Mr. **Chappell.** You don't feel like we have a requirement to increase ammunition?

General **Molinelli.** I didn't say that. I believe that the prioritization process established by the Army is reasonable for both ammunition, RDT&E and OPA 1, 2, and 3.

### DAYS OF SUPPLY CALCULATION

Mr. **Chappell.** What kind of reserves does this give us in ammunition? If we get into a shooting situation, how many days reserve would we have?

General **Molinelli.** I would like to talk to you in terms of days of supply, and introduce to you a new factor which the Army put into their planning called AIIQ, Ammunition Initial Issue Quantity. The Army is introducing this for the first time this year.

Provide me chart No. G-24A.

[Slide follows:]

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# AMMUNITION INITIAL ISSUE QUANTITY
## AIIQ
### DEFINITION

THE AMMUNITION INITIAL ISSUE QUANTITY IS THE QUANTITY OF AMMUNITION, USED FOR PROCUREMENT AND DISTRIBUTION ACTIONS, THAT PROVIDES EACH DEPLOYABLE WEAPON SYSTEM AND UNIT THE INITIAL CAPABILITY TO PERFORM ITS TOE COMBAT MISSION; IS EXCLUSIVE OF THE RESUPPLY QUANTITY; AND IS NOT CONSIDERED DURING SUSTAINMENT COMPUTATIONS.

General **Molinelli**. The Army has adopted a new methodology for calculating days of supply. Current resupply rates are based on modeling which assumes that the authorized initial issue quantity is not in the consumption rate. But rather, it is issued to each weapon and here is a definition of AIIQ.

In the past, the Army counted all ammunition in its inventory when determining the number of days of supply of a given round. This new procedure excludes from that category those number of rounds that provide each deployable weapons system and unit the capability to perform its TO&E combat mission.

[Clerk's note.—Classified slide removed.]

What this translates into in terms of days of supply, you can see on the total with substitutions there for fiscal year 1987, we show ——— when figuring AIIQ. Under our previous method of comparison of days of supply or of computing days of supply, we would have shown ———. I will continue to keep days of supply in both contexts, but this is a new procedure that was accepted by the Secretary, the Office of the Secretary of Defense, just before Christmas, and it clearly accounts for those rounds that are loaded on a deployable weapons system when it goes to war.

We believe that is a more accurate representation of days of supply. Of course, it results in a lesser number of days of supply when displayed in this manner.

Previously, our computer modeling did not account for the combat load out of rounds attributable to each weapons system when it loaded up to go into combat. Where we told an individual he had, for instance, 90 days of supply, when he loaded up his tanks or loaded up his artillery pieces to deploy, he had a lesser number of days of supply immediately. We believe this more accurately depicts the days of supply.

Mr. **Murtha**. Is your comparison of the different years based on a new methodology on it?

General **Molinelli**. Based upon the days of supply as we used to report it to you in terms of $325 million equates to one day of supply in 1978 dollars, or we have escalated it to $442 million to accommodate yearly inflation rate increase.

Mr. **Murtha**. How did you get down from ——— overnight?

General **Molinelli**. There has been no change in the number of rounds. We have changed our computer modeling which previously assumed that each weapon system as it went to war in a day-by-day scenario had the appropriate number of rounds with it to get it through that day of combat.

Our computer model assumes absolutely perfect distribution, and what we have said is that we don't believe in absolute perfect distributon We believe that as a weapon system goes to war, a tank is fielded, it fills it turret with rounds to its capacity and then those rounds are exclude from days of supply computations. There has been no change in the total number of rounds but we now have the tank turret full of ammunition.

Mr. **Murtha**. Well, has there been a change in the goal of the Army? Is your goal now different than it was before? What is the ideal goal?

General **Molinelli**. Well, let me address the stipulated goal first, if I may.

The goal that we are aiming for is in consonance with the defence guidance which is to reach ———.

Under the old calculations of days of supply, you can see that we were getting very close or just achieved ——— and there are reasons for that, new systems coming onboard.

Mr. MILLER. Will the gentleman yield on that?

General, your goal is ——— of supply in the outyears, yet as I understand it, NATO only has ——— of supply; am I correct on that? And if so, how does this work out that they only have ——— but we shoot for as many as ———.

General MOLINELLI. At this time I would be honest with you in that I cannot tell you absolutely that NATO ——— of supply. We have some ongoing efforts with NATO to determine how many days of supply of munition each country has. That is an ongoing effort and I don't have a response in absolute terms yet.

In fact, one could look at our days of supply and while we compute them for ourselves, we are also looking at the NATO nations and hoping that they will increase their days of supply so in the event of war, they won't have to borrow or take from our resources.

Mr. MILLER. Could you furnish for the record as to what the NATO days of supply might be, to the best of you knowledge, and whether you feel that that is correct:

General MOLINELLI. Yes, I will provide that.

[The information follows:]

Allied performance in increasing war reserve materiel will be assessed in the status report of the Cohen Amendment Report to be published by Office of the Secretary of Defense and forwarded to Congress in April 1986.

[CLERK'S NOTE.—As of mid-May the report had not been submitted.]

Mr. MILLER. Also, is there a problem of the NATO nations not conveying that information to us as to what their days of supply may be?

General MOLINELLI. We are working with them to acquire that information. There is some reluctance to provide it, as you could probably well understand, that they are not eager to display the fact that they have a ——— days of supply.

I will provide you what information I can, and tell you where we are on our status of our talks with NATO.

Mr. MILLER. Thank you.

[CLERK'S NOTE.—Classified information deleted.]

Mr. MURTHA. I still didn't get an answer on, is——— days still your goal?

General MOLINELLI. ——— is presently the goal and that is stated in the Defense Guidance. We have some ongoing discussions with the Office of the Secretary of Defense to determine whether or not that is still a valid goal.

Mr. CHAPPELL. At the rate you are going, you will get there in a hurry?

General MOLINELLI. At the rate I am going?

Mr. CHAPPELL. You will get the ———.

Go ahead.

Mr. MURTHA. That is all I have, Mr. Chairman.

Mr. **Chappell**. Please answer the questions on days of supply and unallocated Congressional add-ons for the record.

[**Clerk's note**.—Questions submitted by Mr. Chappell and the answers thereto follow:]

**Question**. What is the total days of supply at the end of the fiscal year 1986 and 1987 funded delivery period using the old methodoloy and using the new methodology?

General **Molinelli**. Information requested is as follows: ———.

**Question**. Was the methodology change in order to justify buying more ammunition? If not, please explain.

General **Molinelli**. The purpose of the change in methodology was not to justify buying more ammunition. Rather, it was made to more accurately reflect the way ammunition must be provided to support combat and, in so doing, provide a more accurate portrayal of sustainability. The old methodology assumed the capability to provide instantaneous resupply. In effect, weapons system entered combat empty and were instantly provided with each round of ammunition as it was required. The new methodology provides for a more realistic protrayal of the way ammunition is required in combat. On its entry into combat a weapon system is provided with an initial on-board load of ammunition. This is the Ammunition Initial Issue Quantity or AIIQ. Once the system enters combat and begins expending ammunition, resupply ammunition is used to maintain the onboard level. When measuring the sustainability provided by a given ammunition stock, the new methodology will normally show a lower value than the old because the new method segregates the AIIQ requirement from the computation. The end result does justify buying more ammunition.

**Question**. The days of supply is a separate calculation for each different kind of ammunition. How are these separate calculations translated into an overall days of supply calculation?

General **Molinelli**. Overall or aggregated ammunition days of supply (DOS) are computed using a weighted-average technique that ties DOS for individual ammunition items to weapons systems densities (firing platforms) authorized in a given time period. Weighting factors reflect the relative preference of munitions for a given year in a particular category (e.g, anti-tank) as determined from computerized warfight simulations (ammunition consumption rates studies).

Preference is based on the quantity of each item within a mix of munitions required to defeat a given target set. Weighting factors dampen the effect on overall DOS of high-inventory, low-preference munitions (generally older munitions) vs. low-inventory, high-perference munitions (generally modern munitions). Also, as variations in weapons densities occur, their effects on ammunition sustainability can be analyzed.

The algorithm results in average DOS by fiscal year for each of four munitions categories (i.e., anti-tank, anti-personnel, anti-materiel and mine/countermine or Family of Scatterable Mines (FASCAM)). Finally, the arithmetic mean of the aggregated DOS for each of the four munitions categories is calculated to give the overall or aggregated munitions DOS.

## UNALLOCATED CONGRESSIONAL ADD-ONS

**QUESTION.** In fiscal year 1986, Congress added $200 million to the budget in an unallocated war reserve ammunition line. How did the Army go about allocating this ammunition?

General **MOLINELLI**. The distribution was made in accordance with Army war reserve and training priorities as well as producibility considerations.

**QUESTION.** Provide a detailed allocation for the record. Include the total funding for each line and impact on war reserve supplies and the production base.

General **MOLINELLI**. The allocation of the increase is as follows:

| Item | Increase/W G-R reduction | | Resulting program W/G-R reduction | |
|---|---|---|---|---|
| | Q (K) | $ (M) | Q (K) | $ (M) |
| CTG, 120mm APFSDS-T M829 | 36 | 54.2 | 82 | 125.5 |
| CTG, 120mm HEAT-MP-T M830 | 4 | 10.6 | 17 | 40.1 |
| CTG, 120mm TP-T M831 | 8 | 9.5 | 37 | 37.7 |
| CTG, 120mm TPCSDS-T M865 | 33 | 28.5 | 72 | 61.5 |
| CTG, 25mm HEI-T M792 | 247 | 5.7 | 864 | 23.7 |
| CTG, 25mm TP-T M793 | 220 | 3.3 | 2,505 | 39.2 |
| Proj, 155mm RAAMS M741 | 16 | 25.1 | 45 | 71.4 |
| Proj, 8 Inch RAP (M650) | 13 | 15.2 | 21 | 24.7 |
| Line Charge M58A3 (MICLIC) | [1] 760 | 9.5 | [1] 1,728 | 21.2 |
| Mtr, RKT 5 inch MK22 Mod 4 f/MICLIC | [1] 157 | 5.7 | [1] 2,905 | 10.8 |
| Hydra 70 Rocket HE/PD | 22 | 6.7 | 22 | 6.7 |
| Hand Grenades all Types | 1,174 | 16.2 | 4,386 | 47.6 |
| Gramm-Rudman Hollings Reduction | | 9.8 | | 26.3 |
| Total | | 200.0 | | 536.4 |

[1] Each

The production base for these items can produce them within proper leadtime constraints. This list has been sent to all four committees for approval. The impact of these increases on war reserve supplies and training levels is as follows:

| Item | Impact |
|---|---|
| CTG, 120mm APFSDS-T M829 | FY86 forward fielding fully supported. |
| CTG, 120mm HEAT-MP-T M830 | FY86 forward fielding fully supported. |
| CTG, 120mm TP-T M831 | FY86 training requirement fully supported. |
| CTG, 120mm TPCSDS-T M865 | FY86 training requirement fully supported. |
| CTG, 25mm HEI-T M792 | Days of wartime supply increased by 3 days. |
| CTG, 25mm TP-T M793 | FY86 training requirement 100% supported. |
| Proj, 155mm RAAMS M741 | Wartime supply increased by———. |
| Proj, 8 Inch RAP (M650) | Wartime supply increased by———. |
| Line Charge M58A3 (MICLIC) | Wartime supply increased by———. |
| Mtr, RKT 5 inch MK22 Mod 4 f/MICLIC | Wartime supply increased by———. |
| Hydra 70 Rocket HEPD | FY86 training requirement 83% supported. |
| Hand Grenades: | |
| Red Smoke | Wartime supply increased by———. |
| Violet Smoke | Wartime supply increased by———. |
| Yellow Smoke | Wartime supply increased by———. |
| White Smoke | Wartime supply increased by———. |
| Green Smoke | Wartime supply increased by———. |

**Question.** Congress also grouped all mortar ammunition into a single line funded $96.2 million and requested the Army to allocate the total. On what basis was this allocation made?

General **Molinelli.** This allocation was made in accordance with Army war reserve and training priorities as well as produceability considerations.

**Question.** Provide the allocation, and an explanation for the record.

General **Molinelli.** The allocation of the increase is as follows:

| Item | Q (K) | $ (M) |
|---|---|---|
| CTG, 81mm HE M821 | 183 | 45.4 |
| CTG, 81mm SMK M819 | 20 | 5.9 |
| CTG, 81mm Illum M853 | 32 | 7.1 |
| CTG, 81mm 1/10 Range M880 | 25 | 2.3 |
| CTG, 81mm Full Range Tng M879 | 0 | 0 |
| CTG, 4.2 inch HE M329A2 | 339 | 30.8 |
| Gramm-Rudman Hollings Reduction | | 4.7 |
| Total | | 96.2 |

These increases sustain training levels and increase days of supply. The production base for these items can produce them within proper leadtime constraints.

**Question.** Why was no funding allocated to 120mm mortar ammunition?

General **Molinelli.** Current on-going R&D efforts preclude any FY86 procurement funding for 120mm mortar ammunition. Initial procurement funding for 120mm mortar ammunition is requested in the FY87 Budget currently being reviewed by Congressional Committees.

[**Clerk's note.**—End of questions submitted by Mr. Chappell.]

### XM864 Basebleed Round

Mr. **Chappell.** The budget includes $31.6 million for the initial procurement of 35,000 XM 864 155-millimeter Basebleed rounds. Describe this round and its requirement.

General **Molinelli.** The XM 864 is the improved conventional munition that we refer to as a Basebleed round, dual purpose, improved conventional munition, which is a supplement to our M 483 A 1 DPICM round, actually a replacement also for the 1M549A1 round, rocket assisted projectile last bought in 1985.

It will go to extended ranges, normally the range for this cannon is somewhere around 16 to 18 kilometers. With a Basebleed, it will go to 29½ kilometers.

It has in the base of the round not a propellent, but a combustible material which burns and reduces the vacuum drag on the bottom end of the round. It is a boat tailed round and as this round goes off and goes out, this combustible material burns and reduces the vacuum, the air dynamic drag on the base of this projectile and we get the extended range.

We have had to trade off a few grenades. This round carries 72 grenades. We have had to trade off 16 grenades that were carried in a round without the Basebleed unit, 12, we traded out, to get this extended range, but as you can see, it increases the range by

60 percent. It is compatible with all of our howitzers and the howitzer improvement program and increases our survivability by letting the howitzers stand off a little farther.

[Slides follow:]

0 PRODUCTION

- 00 LOW RATE INITIAL PRODUCTION IN FY 87
- 00 FY 86 PRODUCTION BASE INTERNAL REPROGRAMMING COMPLETED
- 00 FY 86 FACILITY PROJECT FOR METAL PARTS
  - 000 OMNIBUS STUDIES/SITE SELECTION ON-GOING
- 00 FY 86 FACILITY PROJECT FOR LAP -- MILAN AAP
- 00 FY 87 FACILITY PROJECT FOR BURN UNIT -- TALLEY IND (MESA, AZ)
- 00 INITIAL DELIVERIES -- APR 88
- 00 TOTAL REQUIREMENT (AAO) IS 2111K, 16.6% of DPICM

XM 864 DPICM FINANCIAL SUMMARY
THEN YEARS $ IN MILLIONS

| | FY 85 & PRIOR | FY 86 | FY 87 | FY 88 |
|---|---|---|---|---|
| RDTE | 12.664 | 3.484 | 3.561 | 0 |
| QUANTITY | - | - | 5K | 102K |
| PROCUREMENT | - | - | 31.6 | 71.7 |
| PRODUCTION BASE | - | 13.6 | 11.3 | 7.2 |

## 155MM XM864 DPICM ARTILLERY PROJECTILE

- DUAL PURPOSE IMPROVED CONVENTIONAL MUNITION (DPICM)
  - ANALOG/SUPPLEMENT TO M483A1 DPICM
  - REPLACES M549 RAP PROJECTILE--INCREASES LETHALITY AT EXTENDED RANGES (29.5 KM)
  - BASEBLEED PREFERRED ROUND -- M549A1 RAP SUBSTITUTE ITEM
  - BASEBLEED PRINCIPLE REDUCES VACUUM DRAG
  - EXTENDS DELIVERY RANGE BY 66% - - CRITICAL NEED
  - COMPATIBLE WITH EXISTING HOWITZERS AND HIP
  - ENHANCES ARTILLERY SURVIVAL DUE TO STANDOFF
  - NOT REPLACE M483 DPICM AT SHORT RANGES DUE TO COST ($703 vs $500 IN FY88)

## 155MM XM864 DPICM ARTILLERY PROJECTILE
## (CONT)

0 RDTE TASKS - - FY 86/87

00 DT/OT ARTICLES DELIVERED - APR 86

00 GOVT ENGR DESIGN TEST - MAR 86

00 DT SAFETY TEST (FOR TC-LP) - MAY 86

00 COMPLETE TDP -- SEP 86

00 TYPE CLASSIFY -LIMITED PRODUCTION -- DEC 86

00 DT (RAM, FIRING TABLES) -- MAY 87

00 OT -- JAN-FEB 87

00 INITIATE LRIP PROCUREMENT -- JAN 87

00 COMPLETE INDEPENDENT ANALYSIS -- JUL 87

00 TYPE CLASSIFY STANDARD -- SEP 87

00 DEVELOPMENT ON SCHEDULE

General MOLINELLI. I have another slide on—we are asking to go into low-rate initial production in fiscal year 1987, and had to do some internal reprogramming to get the production base up to where we wanted it and that has been accomplished.

We have not selected the site yet for the metal parts production. We look at having the load, assemble and packing done at, MILAN and the burn unit done by Tally Industries in Mesa, Arizona. Initial deliveries are scheduled for April of 1988.

Our request is for 2,111,000 rounds total for the AAO. The funding is shown on the board there.

Mr. CHAPPELL. Is your test program on target?

General MOLINELLI. Yes.

Mr. CHAPPELL. What are the results of the test? All of the things you have been telling us about have already been tested, 60 percent improvement in range, all these things. Is all the testing complete?

General MOLINELLI. No, it is not tested and complete. We are looking to go into type classification limited production in December of 1986.

We will make an initial procurement and we are looking for completion of our DT&OT testing in January or February of 1987 and type classification standard in September of 1987, but essentially our development is on schedule.

Mr. CHAPPELL. How does the cost of this ammunition compare to the improved conventional munition, ICM, which it resembles?

Mr. BYRON. The initial procurement unit cost in 1987, low-rate production is going to be approximately $850 to $900 a round. Full-rate production is 1988 will result in a unit cost of approximately $650 to $700 a round. The associated ICM unit cost is $500.

Mr. CHAPPELL. Please answer the rest of the questions for the record.

[CLERK'S NOTE.—Questions submitted by Mr. Chappell and the answers thereto follow:]

### TEST RESULTS

QUESTION. What are the results of tests to date?

General MOLINELLI. Seven proving ground flight tests have been conducted on the XM864 DPICM in FY85/86 to verify conformance to the requirements in the Letter of Agreement (LOA) and draft Required Operational Capabilities (ROC). These accelerated engineering development tests evaluated propellant grain ballistic performance, metal parts configuration, modified propellant formulations, ignition and payload explusion charge modifications. The results of these engineering design flight tests have verified the structural integrity of the projectile, and the capability to meet maximum range and precision requirements when fired in moderately hot, normal, and cold environments. There remains a minor concern with range probable error when the projectile is fired at 145°F with the top zone propelling charge. This concern is being currently addressed during the final stages of engineering development. A confirmatory test is expected by mid-April 1986. Early results indicate no significant changes will be required to developmental text/operational test (DT/OT) hardware being procured nor will delivery be delayed.

## ACQUISITION OBJECTIVE

**Question**. What adjustments have been made in the authorized Acquisition Objective (AAO) for the M483 or other rounds as a result of introducing this new round?

General **Molinelli**. The XM864 DPICM basebleed projectile is functionally similar to the M483A1 DPICM, but with its 60 percent increase in range it will be used to attack targets at the outer limits of the M483A1's range and beyond. Consequently, it will supplement, nor replace, the M483A1—the M483A1 will remain the mainstay 155mm artillery projectile. The XM864 is intended principally to replace the M549A1 rocket assisted projectile (RAP) by improving lethality and adding anti-material capability at extended ranges. The table below depicts AAO requirements for these three main 155mm artillery rounds.

[AAO thousands]

| Program | M483A1 DPICM | XM864 DPICM | M549A1 RAP | Total |
|---|---|---|---|---|
| FY86-90 | 12,034 | 0 | 1,522 | 13,556 |
| FY87-91 | 10,574 | 2,111 | 179 | 12,864 |
| Change | -1,460 | +2,111 | -1,343 | -692 |

The addition of XM864 has reduced both M483A1 and M549A1 AAO's. The net effect has been to reduce the total number of rounds required for the combined AAO by over 5 percent.

**Question**. What is the Army Acquisition Objective (AAO) for the XM864, how many will be procured, and at what cost?

General **Molinelli**. The AAO for the XM864 dual purpose improved conventional munition (DPICM) basebleed is 2,111,000. The fiscal year (FY) 87-91 program will procure 630,000 projectiles at a cost of $468.5 million, resulting in ———. An additional 731,000 are required to achieve in accordance with DOD guidance—at a cost of $546.3 million (FY91 dollars).

**Question**. For the record, provide the five year funding profile.

General **Molinelli**. The FY87-91 five year procurement profile for the XM864 DPICM (extracted from the FY87 Budget Request) is as follows:

| | FY87 | FY88 | FY89 | FY90 | FY91 |
|---|---|---|---|---|---|
| Quantity (thousand) | 35 | 102 | 102 | 150 | 241 |
| Cost ($ million) | 31.6 | 71.7 | 74.1 | 111.0 | 180.1 |

**Question**. Where will this round be produced?

General **Molinelli**. The shell metal parts (MPTS) components producer has not been selected. The manufacture of the composite grain and the loading of this grain into the base burn assembly will be accomplished at Talley Industries located in Mesa, Arizona. The load, assembly and pack (LAP) of the complete round was site selected by US Army Armament Munitions and Chemical Command at Milan Army Ammo plant, Milan, TN.

**QUESTION.** What are the funding status and milestones of all production base projects?

General **MOLINELLI.** The initial production facility (Project 5860115) at a site to be selected for the shell MPTS is funded in FY86 for $13.6 million. The project is planned to be awarded in Sept. 86. A project (project 5870115) for shell MPTS has been submitted to Congress for approval at a cost of $10,523 million to bring the production capacity to 10,000 per month on a 1-8-5 shift basis to meet FYDP requirements. This project is scheduled for award in Jan 87. An initial production facility for the load, assemble, and pack (LAP) (Project 5870115) at Milan AAP has been submitted to Congress for approval at a cost of $0.777 million. This facility will have a capacity of 20,000 projectiles per month on a 1-8-5 shift basis. An initial production facility (Project 5880115) for the manufacture of the composite grain and the loading of the grain into the base burn assembly is programmed in the FY88 program for $7.22 million. This project will provide a capacity of 20,000 base burn assemblies per month on a 1-8-5 shift basis at Talley Industries.

**QUESTION.** What production base shortfalls exist, if any, and what are the Army's plans to correct this?

General **MOLINELLI.** There is not sufficient capability to meet Five Year Defense Plan requirements for the 155MM XM864. However, with the implementation of the planned projects listed in the previous answer sufficient capability will exist to meet requirements. Those components with shortfalls being addressed are as follows:

a. Metal parts for the body, ogive, base and base closure. b. Load, assemble, and pack. c. Base burner assembly. d. Propellant grain.

[CLERK'S NOTE.—End of questions submitted by Mr. Chappell.]

## XM-901 105MM TRAINING ROUND

Mr. **CHAPPELL.** In the Statement of Managers for the fiscal year 1986 appropriation bill, the conferees directed the Army to procure not less than 55,000 XM-901 105-millimeter training rounds and to report to the committee on the results of operational experience and plans for future procurement.

What are your plans in this regard?

General **MOLINELLI.** XM-901, DM-128, we refer to it as the LKL round, 105-millimeter tank gun training rounds, a reduced range tank training round, which is required in Europe to reduce the training backlog caused by the noise problem.

[Slide follows:]

# 105MM LKL (XM 901/DM 128)

- GERMAN REDUCED RANGE TANK TRAINING ROUND (LKL)
- REQUIRED IN USAREUR TO REDUCE TRAINING BACKLOG CAUSED BY ENVIRONMENT CONSTRAINTS DUE TO NOISE
- 86 APPROPRIATIONS BILL - BUY 55K W/FY 84 AND FY85 UNOBLIGATED FUNDS ($28.4M)
- 55K ROUNDS WILL MEET USAREUR TRAINING RQMT THRU FY 89. FIELDING OF 120mm TANKS WILL END 105MM TRAINING RQMTS IN USAREUR. THERE ARE NO PLANS FOR CONUS USE
- OUR 120MM HAS SAME FEATURES AS THE XM901

General **Molinelli**. This round is no less noisy, and if anything, perhaps more noisy than the current 105-millimeter training round. The LKL provides us greater accuracy out to 3000 meters yet its reduced maximum range dictates a much smaller safety fan than the current round. Primarily what it does for us is to enable us to use another range at Grafenwoehr, that is now unavailable to us, because our current training round has too great a maximum range.

With the use of that round and the quantity that we are procuring now, by congressional direction, we will be able to train a division and an armored cavalry regiment on the range each year for the next two years, once this round is produced.

Essentially, with this round, we will be able to open an additional range.

Mr. **Chappell**. Upgrade your training substantially?

General **Molinelli**. Turn our people through. The limitation on the range precludes firing on weekends, holidays, and nights because of the noise problem. But with the reduced range of the LKL, we can use another range and turn more people through faster during the week and we will be able to get our training done.

Mr. **Chappell**. When will you sign a contract and when will it be delivered?

General **Molinelli**. All will be delivered in Europe, there is no attempt to bring it to the Continental United States.

Mr. **Byron**. We plan to let a contract no later than September of this year, sir.

Mr. **Chappell**. Has this ammunition already been tested?

General **Molinelli**. We have tested ammunition currently in use in Germany, and we have looked at it for a period of time.

We were reluctant to buy it initially, primarily because of its cost. It is around $502 a round, and what we currently use for training in the same scenario is $160 a round, so we were reluctant to go for it because of the cost increases, but it will put more units through in a shorter period of time. We will do it in Europe.

Mr. **Chappell**. If you have a great deal more accuracy, you will enable your tank teams to compete more effectively.

We have not been doing so well in competition?

General **Molinelli**. I think I know what you are referring to.

Mr. **Chappell**. What are the views of the Training and Doctrine Command and U.S. Army Europe on this ammunition?

[The information follows:]

TRADOC does not want the XM901 for CONUS use as adequate ranges are available to meet training requirements and the round is considerably more expensive than the current M724 ($500 vs. $160). TRADOC supports a limited buy for USAREUR provided the funds do not come out of current training ammunition. USAREUR requests the round since its reduced range feature allows training on one additional range. This will support the noise abatement program in Germany by reducing the daily firing time, and allow more units to train over a given time period.

Mr. **Chappell**. What are the Army's plans for additional procurement?

General **Molinelli**. No plans for subsequent procurement. At the time that we would use up this 55,000 rounds, we will have fielded in USAREUR, our M1A1 tank fleet, using training round technology developed by the Germans. We will use this technology with

120-millimeter tank gun, ammunition which gives the increased accuracy at extended ranges and yet the shorter maximum distance for a smaller safety fan.

Mr. **Chappell**. That round will be able to do what this does in accuracy and training advantage?

General **Molinelli**. Absolutely. We don't intend to buy more than the 55,000 because our 105-millimeter inventory will not be in Europe, only in war reserve and in the United States, and in Germany we will fire the 120-millimeter which uses the LKL technology and is the equivalent round in a different caliber.

## TRAINING AMMUNITION

Mr. **Chappell**. Please answer the questions on Training Ammunition for the record.

[**Clerk's note**.—Questions submitted by Mr. Chappell and the answers thereto follow:]

**Question**. In describing last year's ammunition budget, General Harrison said "Our program does have some shortfalls particularly in meeting out total training requirements". Does this situation still exist with respect to the fiscal year 1987 budget?

General **Molinelli**. Yes. Due to TOA shortfalls throughout all Army accounts, the total ammunition training requirement is not fully funded in the FY87 Budget request.

**Question**. Your ammunition training budget is $519.9 million dollars. What would you consider to be a "full funded" training budget?

General **Molinelli**. The current FY87 Ammunition Budget identifies $519.9 million in support of training needs. To fully fund training requirements, an additional $200.0 million should be added to the program, which will result in a revised funded program of $719.9 million. This funding, along with on-hand inventories would support all training requirements.

**Question**. Your training ammunition budget last year was $719.2 million. It was $630 million in 1985 and $526 million in fiscal year 1984. What accounts for the sharp drop in 1987, particularly when the overall ammunition budget is about level?

General **Molinelli**. The total ammunition budget is not level. A comparison of FY85, FY86 and FY87 is as follows:

| Fiscal year: | *Million* |
|---|---|
| 1985 | $2,500.3 |
| 1986 | 2,497.2 |
| 1987 | 2,254.0 |

As you can see, for example, the FY87 Budget request is $243.2 million lower than the FY86 appropriation. Evaluation of Army priorities (war reserve needs vs training) dictated that the FY87 funding in support of training had to be reduced.

**Question**. In what areas are training ammunition shortfalls most significant?

General **Molinelli**. Significant training shortfalls exist in Small Arms and 105mm Tank ammunition.

**Question**. What is the impact of these shortfalls on training and readiness?

General **Molinelli**. Shortfalls in small arms (5.56mm, 7.62mm, 40mm) will preclude training at limited range and local training areas, with primary impact in Europe and CONUS National Guard units. Tank training will be constrained to 74% of the STRAC requirement with all Army units being affected.

**Question**. To what extent, if any, have training ammunition budget shortfalls resulted in a drawdown of war reserve stockpiles in the last several fiscal years?

General **Molinelli**. Training ammunition budget shortfalls have resulted in a drawdown of war reserve stockpiles of small arms, hand grenades, pyrotechnics, demolitions, and 155mm HE M107 and Illumination rounds. The following table reflects quantities and dollar value of the drawdown by item that will occur within the FY 87 Funded Delivery Period (FDP).

| Item | FY 87 FDP | |
|---|---|---|
| | QTY(K) | $(M) |
| 5.56 Ball M193 | 22,646 | 3.1 |
| 5.56 Ball for M16A2 | 74,830 | 2.9 |
| Cal .45 Ball | 5,690 | .7 |
| 40mm Green Star Para | 22 | .4 |
| 40mm Red Star Para | 18 | .3 |
| Chg Demo TNT ¼ LB | 371 | .7 |
| Chg Demo TNT 1 LB | 104 | .5 |
| Chg Blasting M6 Electric | 224 | .6 |
| Cap Blasting Special Non-Electric | 239 | .2 |
| Chg Demo Shaped 15 LB | 12 | 1.7 |
| Igniter Fuse Blasting Time | 150 | .4 |
| Demo Kit Bangalore Torpedo | 5 | 2.8 |
| Proj 155mm HE M107 | 252 | 46.3 |
| Proj 155mm Illum | 46 | 22.3 |
| Grenade Hand Frag M67 | 486 | 4.0 |
| Grenade Hand Riot CS M7A3 | 83 | 1.5 |
| Signal Illum Gnd Red Star Cluster | 32 | .8 |
| Signal Illum Gnd Red Star Cluster | 100 | 2.6 |
| Signal Illum CS M125 | 64 | 1.6 |
| Flare Surface Trip M49 Series | 60 | .9 |
| Total $ (M) | | 94.3 |

**Question**. General Molinelli, what is the impact of this drawdown on war reserve days of supply?

General **Molinelli**. Training ammunition budget shortfalls result in reduced war reserve stockpiles in pyrotechnics, demolitions, hand grenades, 155mm Howitzer and small arms. The drawdown does not result in less than ——— of supply for any item. Training would be severely curtailed if the drawdown threatened to take stocks below ——— of supply. None of the items affected are high interest, high technology items.

**Question**. According to any Army information paper, the authorized training ammunition expenditure goes from $796 million in fiscal year 1985 to $1.121 billion in fiscal year 1986. Explain this dramatic increase.

General **Molinelli**. The fiscal year 1985 authorization shown on the Army information paper is the year-end authorization. Beginning authorization for FY85 was $992 million. Authorizations are revised throughout each fiscal year due to changes in weapon systems fielding, ammunition suspensions, production slippages, range problems, and other factors that prohibit training ammunition use. Major commands turn unneeded authorizations back to HQDA each quarter for redistribution to other commands or carryover to the next fiscal year. Ammunition not expended during the fiscal year is available for training in future fiscal years. The remainder of the increase ($129 million) is attributed to Army-wide implementation of the Standards in Training Commission (STRAC) training strategies in fiscal year 1986. During 1986, a validation program is ongoing to determine if ammunition quantities specified by STRAC are adequate or excess to actual training needs. Training ammunition was authorized in 1986 at STRAC levels where possible to ensure an adequate validation program. As the strategies are refined, training ammunition authorizations will be brought more closely in line with actual training needs to attain and sustain readiness.

[CLERK'S NOTE.—End of questions submitted by Mr. Chappell.]

## MORTAR AMMUNITION

### 81MM TRAINING ROUND

Mr. CHAPPELL. Mr. McDade.

Mr. McDADE. The 81-millimeter training round, when are you going to type classify that?

General MOLINELLI. Full-range training round?

Mr. McDADE. The one-tenth is the one I am talking about.

General MOLINELLI. Which one?

Mr. McDADE. One-tenth.

General MOLINELLI. It is being type classified now. We have——

Mr. McDADE. It has been being type classified for a long time. What is the hold up?

General MOLINELLI. The holdup occurred in conjunction with negotiations for a licensing agreement with the manufacturer.

Mr. McDADE. Is it overcome?

General MOLINELLI. Yes.

Mr. McDADE. The whole proposal is a proposal to you that came in from the contractor?

General MOLINELLI. Correct.

Mr. McDADE. We have been informed on four occasions going back to last year the type classification was imminent and we have been going round and round in a revolving door again. We have got to get this round type classified.

General MOLINELLI. We have gone through a very unnecessary do-loop on this thing. We have to have some assurance of safety on this round, identified a solution, asked the contractor to take that action.

One of the big holdups is that in negotiations between the contractor and our PM mortars. We attempted to buy the technical data package for this round so we could produce it competitively. The contractor asked $4.5 million for the 81 millimeter and the 60 millimeter rounds, and when we brought this to the attention of the Under Secretary, looking at all the financial arrangements in there, they seemed very unnecessary and the Under Secretary has directed that we negotiate with the contractor for an immediate five-year purchase of the one-tenth training round for the 81-millimeter mortar, not to try to buy the technical data package, and fix and test the round expeditiously.

[Additional information follows:]

Army Materiel Command has directed the Acting Project Manager—Mortars to negotiate a five-year buy from the manufacturer without obtaining a licensing agreement and to prepare performance specifications for open competition if the manufacturer's follow-on prices are too high.

Mr. McDade. What I want to do is to get something from you, when you will type classify this. It has been going on too long, and you have got a contract that was prepared by the contractor. He did all the facilitization, R&D, and you think it is an awfully good training round?

General Molinelli. The only deficiency we found is the absence of a safety margin in the body of the projectile, and a fin problem with the 60mm round.

Mr. McDade. My understanding is that that problem has been remedied.

General Molinelli. I don't believe the 60mm round has been tested, sir. We told then what is required to be done, but we have not tested that round, not resubmitted the round for test.

Mr. McDade. How long will it take after you get a new round to test?

General Molinelli. Less than a month, sir.

Mr. McDade. Less than a month?

General Molinelli. If I could submit that for the record, the actual duration for the test.

Mr. McDade. If you are not going to buy the documents, you could type classify it and buy the round tomorrow, couldn't you?

General Molinelli. Can't type classify the 60mm round, sir, if it doesn't meet safety requirements.

Mr. McDade. I will assume that that problem is taken care of. If that probelm doesn't exist and you will not pay for the documents, you can buy the round tomorrow?

General Molinelli. That is our intention. We have ceased negotiations with the contractor to buy the technical package, and I sent out a message telling AMC to negotiate a contract for a 5-year supply.

Mr. McDade. What is a reasonable time for you to call me back and tell me it is type classified?

General Molinelli. I will call you back tomorrow and give you a status report and at that point, I will give you a reasonable time.

## 120MM MORTAR AMMUNITION

Mr. McDade. All right, General. I would appreciate that very much.

The budget includes $64.5 million to fund three types of 120-millimeter mortar ammunition. This is the first year procurement, I believe, on that particular item.

Can you tell us what kind of a procurement strategy you will engage in to buy that?

General MOLINELLI. Yes, sir. I have a chart on the 120-millimeter mortar ammunition and that is A-7A, please.

[Slide follows:]

## 120MM MORTAR AMMUNITION

- o RFP ISSUED 14 NOV 85 - BIDS DUE IN 15 APR 86
- o SOURCE SELECTION O/A 15 AUG 86
- o FULL AND OPEN COMPETITION - SYSTEM INCLUDES MORTAR AND FULL FAMILY OF AMMUNITION
- o OFF SHORE BUY FOR 9TH ID AND TEST PURPOSES ONLY IN FY87 - US PRODUCTION BEGINS IN FY88
- o PAA FUNDING PROFILE:

| | | FY86 | FY87 | FY88 |
|---|---|---|---|---|
| HE | $ | 0 | 44.7 | 42.6 |
| | Q | 0 | 126 | 141 |
| ILLUM | $ | 0 | 5.5 | 5.6 |
| | Q | 0 | 11 | 14 |
| SMOKE | $ | 0 | 14.3 | 14.2 |
| | Q | 0 | 29 | 34 |

TRAINING - TO BE DETERMINED

- o FY87 UNIT PRICES:

| | |
|---|---|
| HE | $354.76 |
| ILLUM | $500.00 |
| SMOKE | $493.10 |

General Molinelli. The RFP, the request for a proposal, went out on the 14th of November and we are expecting the bids to end on the 15th of April. The source selection will be in mid-August and it is full and open competition, which says that the bidders can bid on the whole family, the tube, the ammunition and the various components or any of the components.

Our initial acquisition as shown in the budget submitted is an off-shore buy for a limited number of tubes and a limited number of rounds for 1987 to go to the 9th Infantry Division for testing.

Funding profile is shown on the chart, sir.

Mr. McDade. What requirements are most likely to be met by off-the-shelf alternatives and what sort of a product improvement, if any, is contemplated?

General Molinelli. The requirements that I can see in an off-the-shelf, we essentially have at least one contractor with an already developed and fielded weapon which is, I guess you call that an off-the-shelf weapon.

Mr. McDade. Or NDI, we could call it?

General Molinelli. Yes, sir. And I have a chart 7-B which provides some of the technical background to the round as compared to the 4.2-inch mortar and then to address the—I will let you read that first, sir.

[Slide follows:]

## 120MM VS 4.2-INCH MORTARS: COMPARISON OF TECHNICAL AND PERFORMANCE CHARACTERISTICS

### HIGH EXPLOSIVE (HE) ROUND

| | 4.2-INCH | 120MM[1] | IMPROVEMENT | % CHANGE |
|---|---|---|---|---|
| UNIT COST (STANDARDIZED)[2] | $190.00 | $320.00 | + $130.00 | + 68% |
| DIAMETER OF ROUND | 107MM | 120MM | + 13MM | + 12% |
| WEIGHT OF ROUND | 22 LB | 29 LB | 7 LB | + 32% |
| RANGE (MAXIMUM) | 6800 M | 7200 M | + 400 M | + 6% |
| RANGE (MINIMUM) | 800 M | 200 M | + 600 SQ M | + 75% |
| LETHAL AREA OF BURST | 750 SQ M | 1450 SQ M | + 700 SQ M | + 93% |
| LETHALITY INDEX | 1.0 | 1.5 | NA | + 50% |
| SUSTAINED RATE OF FIRE | 3 RPM | 5 RPM | + 2 RPM | + 67% |
| MAXIMUM RATE OF FIRE (THREE MINUTES) | 12 RPM | 15 RPM | + 3 RPM | + 25% |

NOTE 1: 120MM DATA WAS OBTAINED FROM THE JUNE 1984 AMSAA HEAVY MORTAR OPTIONS STUDY, WHICH WAS USED IN DEVELOPING THE REQUIRED OPERATIONAL CAPABILITY (ROC) DOCUMENT FOR THE 120MM SYSTEM.

NOTE 2: COST DATA WAS STANDARDIZED FOR FY85 CONSTANT DOLLARS AND COMPARABLE FUZE COMBINATIONS. LIFE CYCLE UNIT COST OF THE 120MM HE ROUND IS APPROXIMATELY $250.00.

General Molinelli. This talks about the weight and the range; having improvement in the minimum range, we can shoot as close as 200 meters and this has never been achievable before. Lethal area burst is almost twice that of the the 4.2-inch mortar, lethal index, 50 percent greater, has a higher sustained rate of fire, and a higher maximum rate of fire.

You asked me about product improvements. I am not aware of any product improvements.

We are adding to the request for proposal a training round, and one-tenth training round. We will go in the RFP, but we are not asking for that in the original contract. The TRADOC and DCSOPS community have not stated that as a requirement.

Mr. McDade. Is there money in the budget for the 4.2 this year?

General Molinelli. We have money in for the last year's buy which is this year, the year you are studying now, fiscal year 1987, and I will find you the number. $22 million for 247,000 rounds of mortar ammunition.

We believe this will be sufficient as the 120 comes on; we won't have to buy any 4.2 mortar for our stocks.

Mr. McDade. Please answer the following questions for the record.

General Molinelli. Yes, sir.

[Clerk's note.—Questions submitted by Mr. McDade and the answers thereto follow:]

### 81MM SMOKE AND ILLUMINATION ROUNDS

Question. The budget also includes $11 million for 45,000 XM819 81mm smoke rounds and $3.4 million for 12,000 XM853 illuminating rounds. This is the second year for funding for these rounds. These rounds were both recommended for limited procurement pending demonstration that certain technical problems were overcome. Has the XM853's performance and reliability been satisfactorily demonstrated? Please explain.

General Molinelli. The tests to demonstrate the XM853's performance and reliability are included in the residual tasks to be performed following type classification for limited procurement. These tests will be conducted during third quarter fiscal year 1986.

Question. Have the high temperature tests to demonstrate correction of leaks during high temperature storage in the XM819 shown that this problem has been satisfactorily resolved? Please explain.

General Molinelli. The high temperature tests for the XM819 are one of the residual tasks remaining from the In Process Review that recommended type classification for limited procurement on January 22, 1986. These tests will be conducted during the third quarter fiscal year 1986.

Question. Has the recommendation for type classification limited procurement for the XM853 and XM819 cartridges been approved?

General Molinelli. The recommendation to type classify the XM853 and XM819 cartridges for Limited Procurement was received from Army Materiel Command on February 21, 1986 and is presently being reviewed by the Army Staff. Approval of this type classification is expected to occur about April 14, 1986.

**Question.** When does the Army expect the XM853 and XM819 cartridges will be type classified to permit future procurements, including the fiscal year 1987 planned program?

General **Molinelli.** A special In Process Review (IPR) to type classify these rounds Standard is scheduled for 4th quarter fiscal year 1986.

### IMPROVED 81MM HIGH EXPLOSIVE ROUND

**Question.** The budget includes $91.3 million for procurement of 404,000 rounds of M821 81mm high explosive ammunition for the Improved 81mm mortar. From fiscal year 1985 to 1988, the budget for this line goes from $67.8 million to $47.7 million to $91.3 million to $23.5 million. How do you account for this erratic procurement profile?

General **Molinelli.** The fiscal year 1987 procurement profile includes an increase of $60.1 million allocated to the M821 Improved 81mm high explosive round out of a general ammunition increase provided by OSD to improve days of supply and sustainability. The M821 Improved 81mm High Explosive round is being bought offshore from the United Kingdom's Royal Ordnance Factories. FY88 is not the last year of production, although it is currently the last year of the Army buy. Subsequent buys support US Marine Corps requirements in FY89, 90, and 91.

**Question.** These rounds are being procured offshore from the United Kingdom. What is the one-shift capacity of the production line?

General **Molinelli.** The United Kingdom's Royal Ordnance Factories have reported a current annual production capability of approximately 900,000 rounds. They also have indicated a substantial expansion capability to accommodate production surges in support of other customers.

**Question.** When combined with the fiscal year 1987 Marine Corps procurement of 565,000 rounds, the total buy is about twice the one-shift capacity of the line. Why have you formulated a budget on this basis?

General **Molinelli.** Royal Ordnance Factories has indicated the capability to support both the US Army and US Marine Corps buys in fiscal year 1987, as well as their other customers.

**Question.** How many of the rounds to be procured will be used to satisfy the Army's M821 HE annual training requirements?

General **Molinelli.** The fiscal year 1987 procurement of 404,000 M821 high explosive rounds includes training requirements for 26,747 rounds.

**Question.** Can the M374A3 HE cartridge satisfy the training requirements for the M821 HE cartridge? Please explain.

General **Molinelli.** The M374A3 cartridge can be used to satisfy all 81mm training requirements except the minimum 26,747 rounds for "hands-on" experience.

**Question.** If the M374A3 HE cartridge can be used to meet the M821 HE cartridge training requirements, does the Army plan to do so? Please explain.

General MOLINELLI. The M374A3 is used for 90% of the Army's 81mm live fire HE training; the M821 is the remaining 10%.

QUESTION. The M889 HE cartridge does not meet the current Army performance requirements for its I81mm HE cartridge. It is, however, similar to the M821 HE cartridge except for the fuze. Can the M889 HE cartridge be used to meet the M821 HE cartridge training requirements? Please explain.

General MOLINELLI. The M889 HE cartridge is the same cartridge as the M821 HE cartridge, except that it is equipped with the M935 Point Detonating Fuze instead of the M734 Multi-Option Fuze. 100,000 of these rounds were procured in fiscal year 1985 for war reserves only. These rounds will not be used for training purposes.

QUESTION. If the M889 HE cartridge can be used to meet the M821 HE cartridge training requirements, does the Army plan to do so? Please explain.

General MOLINELLI. The M889 cartridges were procured for war reserves only and will not be used for training purposes.

[CLERK'S NOTE.—End of questions submitted by Mr. McDade.]

## 105MM ARTILLERY AMMUNITION

Mr. McDADE. The Army has budgeted initial procurement of a new 105-millimeter howitzer in fiscal year 1987. What new ammunition rounds will the Army be developing and buying for this howitzer?

General MOLINELLI. We have a number of 105-millimeter training rounds to go with the new XM-119 light howitzer.

I will show you a chart, 10-A-A. There are five new rounds and go just to the rounds.

Mr. McDADE. Why are new rounds needed?

General MOLINELLI. Go just to the rounds that would be—well, go to 10-A-B.

[Slide follows:]

## DEVELOPMENTAL ROUNDS

| ROUND | DESCRIPTION | RANGE(KM) | RANGE INCREASE | LETHALITY INCREASE | M101/M102 | XM119 |
|---|---|---|---|---|---|---|
| XM913 HE RAP | H1 FRAG STEEL<br>M200 CHARGE | 19.5 | 30% | MINOR | NO | YES |
| XM927 HE RAP | XM913 W/<br>M67 CHARGE | 16.5 | 10% | MINOR | YES | YES |
| XM915 DPICM | 42 SUBMUNITIONS<br>M200 CHARGE | 13.2 | 15% | 100% | NO | YES |
| XM916 DPICM | XM916 W/<br>M67 CHARGE | 10.7 | --- | 100% | YES | YES |
| M760 HE | M1 MOD W/<br>M200 CHARGE | 14.3 | 20% | NONE | YES | YES |

NOTE: M200 PROPELLANT INCOMPATIBLE W/ EXISTING US HOWITZERS.

General MOLINELLI. There are five new rounds, Mr. McDade, and the first one is a high-explosive rocket-assisted projectile to give greater range. We have a 30 percent increase in range.

Mr. McDADE. Tell me first why you need five new rounds?

General MOLINELLI. Basically we need five new rounds for the 105-millimeter because of the limited range and lethality of the previous ammunition. The 105 millimeter is a very limited-range weapon and the previous 105 millimeter rounds have poor lethality.

Mr. McDADE. Okay, explain it on the chart.

General MOLINELLI. As you can see, we have a range increase in four of the five new rounds and the one that does not give us a range increase, does give us a 100 percent lethality increase.

Mr. McDADE. How much are these going to cost compared to those that they replace?

General MOLINELLI. I can't respond to the unit costs at this time because they won't come in the inventory until 1988 for the rocket assisted projectile and 1990 for the dual purpose conventional munition.

I will provide it for the record, an estimate of the unit cost.

[The information follows:]

The following chart depicts the appropriate procurement costs for old and new 105mm ammunition.

| Previous Round | Cost per round ($, FY87) | Replacement Round | Cost per round ($, FY87) |
|---|---|---|---|
| M1 HE | $157 | M760 HE (M1 conversion) | $45 |
| M444 ICM | 570 | XM915 DPICM | $502 |
| M444 ICM | 570 | XM916 DPICM | $468 |
| M548 RAP | 459 | XM913 RAP | $379 |
| M548 RAP | 459 | XM927 RAP | $345 |

The costs for the new rounds are from the third year of procurement in order to allow the prices to stabilise and to take advantage of learning curve benefits. First year costs will be 30-35 percent greater.

Mr. McDADE. Can all the rounds be shot from the old 105-millimeter howitzers?

General MOLINELLI. Two of the rounds are not interchangeable in the M 101 and the M 102 howitzer, the new XM 913 rocket assisted projectile and the XM 915 DPICM.

Mr. McDADE. When will procurement begin of those rounds?

General MOLINELLI. 1988 for the rocket-assisted projectile and 1990 for the DPICM.

[Additional information follows:]

The conversion of 120,000 M1 high explosive (HE) rounds to M760 HE (by replacing the M67 propellant in the M1 with M200 propellant) was funded in the FY85 program ($5.4 million). The XM913 rocket assisted projectile (RAP) procurement will begin in FY88. The XM915 dual purpose improved conventional munition (DPICM) procurement will begin in FY90. The decision on procurement of the XM927 RAP and XM916 DPICM, which are compatible with the existing family of howitzers, has been deferred pending completion of the P93 ammunition rate studies in late 1986.

Mr. McDADE. Tell us something about your procurement strategy, please. What is your strategy in getting these rounds bought?

General MOLINELLI. The rounds are in development. Metal parts will be industry procured, and the load, assemble and pack of these rounds will be in our government-owned contractor-operated plant, which has not been site selected yet.

Mr. McDADE. Metal parts and LAPing are what you are talking about?

General MOLINELLI. Load, assemble and pack.

Mr. McDADE. Describe the metal parts.

General MOLINELLI. Basically, we forge and turn the projectile and the components thereto, so that is the operation that is normally done by industry in this caliber.

Mr. McDADE. For the record, put in the record the development and testing milestones and the funding profile for each round that you want to buy.

General MOLINELLI. Yes, sir, I will provide it

[The information follows:]

The FY87 Budget Request contains no FY87-91 procurement funding for either the RAP or DPICM. Procurement funds are in the FY88-92 program being developed currently. The developmental and testing milestones for the XM913/927 RAP and XM915/916 DPICM cartridges follow:

| | XM913/927 RAP | XM915/916 DPICM |
|---|---|---|
| Engineering Development | | |
| Parts Contract Award | Mar 86 | Mar 86 |
| DT II | Aug 87–Apr 88 | Nov 88–Apr 89 |
| Safety release | Aug 87 | |
| OT II | Sep 87–May 88 | Feb 89–Jul 89 |
| TC–Limited Production | Dec 87 | |
| TC–Standard | Aug 88 | Sep 89 |
| Initial production | FY88 | FY90 |
| First Unit Equipped | 2d Qtr FY89 | 4th Qtr FY91 |

## PRODUCTION BASE

Mr. MILLER. General, with regard to the production base program that you spoke of, $353 million, that included facilities as I understand it.

Apparently the government owns facilities for production of ammunition, and also we contract out for certain production of ammunition.

General MOLINELLI. True.

Mr. MILLER. Can you give us a little rundown as to how it is decided what we should own and what we should invest in, and when we should contract out?

General BOWEN. Sir, to the maximum extent possible, we try to go to the commercial side of the house, whenever we can. There are some things that industry is not interested in, for many reasons, one of them certainly being in the propellant and explosive area.

In most cases, we talk about items that industry can produce, taking maximum advantage of them. We deal with about 2500 firms on almost a daily basis, and they are subcontracted.

I think the answer to your question is, we only bring in-house what it is that we cannot count on industry to provide for us when we go to mobilization, and certainly industry cannot provide the large numbers of explosive and propellents or the tremendous LAP capability that we need in the mobilization quantities that we have to have.

Mr. **Miller**. Would you say the facilities that we have at the present time are cranked up and in operation and producing continuously, or does it take time to even put those facilities into production?

General **Bowen**. The production base that we have right now, to produce up to our Five Year Defense Plan (F.Y.D.P.) quantities, is pretty much in production at this time, and ongoing.

If we look at what it takes to produce mobilization quantities, then that is a different side of the house. We have, as you probably know, a tremendous shortfall in the facilities that we would need to produce mobilization quantities.

Updating a previous 1983 GAO report, that shortfall through the year 2000 is approximately $65 billion. Understanding that, we have designed a 15-year enhancement plan, which, if you will, simply means that a more practical figure may be to devote $500 million a year to mobilization, slowly work toward that total mobilization requirement that we see, so the answer to your question is, no, for mobilization purposes; yes, to produce FYDP quantities.

Mr. **Miller**. But we are interested in mobilization, and you are saying, as I understand it, that in case of a war, of an international problem, that additional facilities would need to be built either by the Federal Government or the private contractors, and we would have to start from scratch in order to do this, and it may take a year to put those facilities into production. Is that what you are saying, that we could be a year behind?

General **Bowen**. Let me back up just a second.

Yes, to reach total mobilization we estimate it would take from 12 to 18 months, depending on how much warning we had, when that period would actually start. Now, certainly with the current production base, we have a surge capability by going to, instead of the one shift that we normally operate now, going to three shifts, working seven days a week instead of five days a week, we have the capability to surge toward that mobilization figure, but to reach the mobilization requirement, it would take 12 to 18 months.

Some of those facilities are laid away, so, no, we don't have to rebuild all of our facilities. It would mean taking them out of layaway status, and in some cases, modernizing them and bringing them up to today's standards for what we would need. But there are other cases where we would have to start from scratch.

Mr. **Miller**. That is the situation with regard to manufacturing of the ammunition, the end product. Now, you also need the black powder, you need this type of thing.

Does the Federal Government own facilities that manufacture the black powder, or is that all under contract? Where do we stand with regard to a surge capability in order to have the ample supplies necessary to manufacture that end product?

General **Molinelli**. I would like to respond to that.

When we are talking specifically about explosives and propellents, this is an area where we see there is very limited participation by commercial contractors, so that they are primarily government facilities. We own and operate facilities for most or all of those items, if not 100 percent of it.

As a matter of fact, right now you specifically mentioned black power, we can both produce it and buy it commercially, and we have the capability to produce more of it.

We look at storing a number of the propellents and explosives, particularly the RDX and HMX compositions. The shelf life is relatively indefinite, and we look at producing and storing a number of those things.

Typically, in terms of lead time for mobilization, when we talk about, as General Bowen has stated, putting a new round on a line in an existing plant, we can run anywhere from two to three months, in a surge of an ongoing line, to as long as 18 months when we bring a retired line back into operation. The components that are normally the long-lead times, are machine metal parts moderately easy to come by given the money, that is three to six months. I can have a pretty good pile of machine metal parts, but not so in explosives and in propellents. Those are things that the United States Government does best, because of the vast amount of area required to protect other facilities from them during the manufacturing process. And so we do look at producing and storing more in the explosives and in the propellent area than obviously trying to do any stockpiling of the machine metal parts for actual round production.

Mr. MILLER. A little while ago we talked about the fact that the NATO nations may have ——— of supply. Are they too in a position to manufacture the ammunition that we are talking about, or are they relying on us to manufacture and ship to them?

General MOLINELLI. They do both things. They buy from us. They buy from each other, and of course in some cases—obviously they produce for themselves. So we look at a mix of things when we look at the NATO nations.

They, for instance, have a very, very limited RDX-HMX base. My colonel over here, Colonel Hood, just returned from there last Friday. We are looking at consolidating their requirements, so that we jointly can build in one nation, for instance, a certain 155 round economically for their needs, and perhaps in a reciprocal agreement, the other nations will build something else for the NATO needs. We recognize there is a problem in this area. We are looking at alternative ways to solve it.

Of course, as you well understand, one of the biggest detractors is their inability to increase their investment in their armed forces and their sustainability.

Mr. MILLER. And that concerns me a great deal, and that is the reason for the questioning, as to whether they are willing to assume responsibility and expend what is necessary or whether they are relying wholly, almost wholly, on us in order to do that.

Also, when you speak of putting a particular manufacturing capability in one nation, it seems like we are putting all of our eggs in one basket. But if we spread it out a little, then we could not have one facility destroyed and then not be able to manufacture that particular ammunition in another area.

Is that a problem? Are we putting all our eggs in one basket?

AVAILABLE

General MOLINELLI. No, sir, I don't believe so. What we are looking at is, for instance, say in the 155 line, there are six rounds produced. We might look at one or two rounds per nation over there to specialize and be able to run that one line at an economical rate to provide for themselves and for their neighboring countries. In another nation they would run one or two lines, so we wouldn't have all our 155 rounds in one nation, but we would have perhaps one type of round consolidation in one nation, where it could run at an economical rate at a better price for larger consolidated quantities.

Normally we find ammunition rates are to be economical, particularly for a NATO nation, they just can't afford to make that investment, because of the 1/8/5 shift for their needs, they only need to run about two or three months to meet their requirements. So if they consolidated the requirements to where they have an annual efficient shift, they can buy it cheaper, and that is what we are looking at, is distributing required consolidated requirements among the nations so that they can produce at efficient rates, rather than inefficient rates in any one of four, five, or six nations.

Mr. MILLER. This brings up a question on a remark that you had made a little while ago regarding off-shore buying. In other words, I am thinking of "Buy American," for many reasons, including in case we have a problem where we would not be able to have ammunition coming in.

Are we purchasing our ammunition from other nations and stockpiling it here?

General MOLINELLI. Yes, sir, we are. We are buying the 81-millimeter mortar, the system itself, plus the improved 81-millimeter mortar ammunition from the United Kingdom.

As we just talked earlier, we will be procuring 55,000 rounds of the LKL 105-millimeter tank training round from the Federal Republic of Germany. We are buying the AT-4 from Sweden, which is a shoulder-fired light-weight individual weapon.

The initial procurement of the 120 millimeter mortar, both system and ammunition, is probably going to come from an offshore government and we don't know which one yet.

Mr. MILLER. Would you furnish for the record what percentage of our ammunition we are purchasing off shore?

General MOLINELLI. Yes, sir, I will do that.

[The information follows:]

The fiscal year 1987 Ammunition Hardware funding request is $1900.1 million. Within these total dollars $244.9 million support offshore procurement. This equates to 12.8 percent of the hardware total obligation authority.

## NUCLEAR ACCESSORY KITS

Mr. MILLER. I had one other question, Mr. Chairman, if I may ask it.

On page 4 of your statement, I notice that you speak of nuclear weapon accessory kits, and on page 10 you mention nuclear material. Now, the Department of Energy handles the nuclear part of the defense program. What are you talking about when you refer to nuclear weapon accessory kits?

You are asking for repair or purchase, and I am not sure what those kits are. This is at the end of the first paragraph on page 4.

General MOLINELLI. I'm sorry, sir, the reference statements that you are talking about is my opening statement, the one that we submitted for the record?

Mr. MILLER. That is correct. In other words, how are you involved in this nuclear weapon system? You are not purchasing that nuclear material?

General MOLINELLI. No.

Mr. MILLER. The Department of Energy is furnishing it, but you are furnishing some kind of a nuclear accessory kit?

General MOLINELLI. Yes, sir. You are absolutely correct. We do not buy the nuclear weapon. That is furnished by the Department of Energy, but we have a requirement to buy a weapons delay access kit, that is, to prevent somebody else from getting to that weapon.

We have to buy the permissive action link, which permits that weapon to be operational, or in other terms, it would safeguard that weapon from somebody else trying to activate it.

We make repair parts for these components. The accessory kits, I can't explain to you all the components of the kits, but essentially we buy the packaging, the material that goes around the nuclear weapon. We provide the training devices.

Specifically, in 1987, we are asking for money to buy 37 training devices for the 155-millimeter nuclear weapon, so the Army has the responsibility to buy all the accessories except the actual weapon itself and the nuclear componentry within it.

Mr. MILLER. And where are those put together? Where do we have an assembly line? Is there some location where you ship all of the component parts in and then assemble a nuclear weapon?

General MOLINELLI. No, sir. When the Army gets a nuclear weapon, it comes to us complete from the Department of Energy.

What we have acquired previously is the ability to transport it, store it, train on it, train our crews on it, but the weapons themselves the Army does not put together. It comes to us and we take possession of it as a complete weapon in a box, and it is assembled in the Pantex facility at Amarillo, Texas. From that is a complete weapon. The Army doesn't put them together at all.

Mr. MILLER. Thank you, General.

Thank you, Mr. Chairman.

Mr. CHAPPELL. Mr. Murtha.

Mr. MURTHA. No questions, Mr. Chairman.

## COPPERHEAD

Mr. CHAPPELL. Let me ask you a few questions.

What is the AAO for Copperhead?

General MOLINELLI. The AAO for Cooperhead, Mr. Chairman, at this point in time with our P90E studies is 164,000, I believe.

Mr. CHAPPELL. How many are you intending to purchase?

General MOLINELLI. The Army's procurement objective for Copperhead is 31,000-odd projectiles. It is an affordability constraint that has been imposed, both affordability and either there is some influence from DCSOPS on the status of the Aquila program and not having it onboard, 50 percent of the total requirement, 164,000 rounds, for Copperhead is driven by the Aquila. Until we have it really here, I don't see that that cap on the Copperhead procurement objective will change.

Mr. **Chappell**. That solves the question with reference to second sourcing?

General **Molinelli**. Not necessarily. You know, when we look at the Copperhead, we also have to consider the Marines buy and the degree of commonality in the Navy five-inch guided projectile. Although we have had two previous studies that set the cross-over point for cost effectiveness somewhere around 60,000 to 90,000 rounds, one study talks to it about 30,000 rounds. The Army wasn't interested in proposing to industry a proposal that said, you know, we would like you to bid on the remaining rounds to be produced, but instead to bid both for the Army, Marines and the Navy, assuming the commonality. We have a program with the Navy to increase the commonality.

Mr. **Chappell**. What are the companies geared up to do it other than the one that is presently producing it?

General **Molinelli**. Other than Martin Marietta? I am told that there are about 12 contractors who are interested in it, and we will provide that for the record, if I may.

[The information referred to follows:]

The following companies have all expressed an interest in second sourcing Copperhead: Honeywell, General Dynamics, McDonald-Douglas, Hughes Aircraft, Texas Instruments, Raytheon, Boeing, Rockwell, Grumman Aerospace, Hamilton Technology ISC Defense Systems, Brunswick, Marquardt Co., Speedring Division of Rexham and Bendix Guidance of Allied Corporation.

Mr. **Chappell**. Does that mean that the government pays for the establishment of their production line?

General **Molinelli**. No. The strategy that we are looking at was to have the second-source facilitize himself, and we will promise him a buy initially. In the second year, we were going to have him begin to go with a piece of the action in a competition against the present prime producer.

Mr. **Chappell**. How much of the total buy were they promised?

General **Molinelli**. We haven't released the RFP, and I can't give the actual figures of the total buy, but I suspect that to be economical to anybody to bid that we have to give them a minimum of 35 percent, and probably a maximum of 65 precent of the total remaining buy. We would like to have——

Mr. **Chappell**. How many projectiles will that be?

General **Molinelli**. Total remaining projectiles, I have got here. For the Army, we have I think 21,000. I'm sorry, that is for all of them.

I will provide that number to you, sir. I would have to add up the figures. I have them here.

[The information follows:]

There are 23,524 Copperhead projectiles which remain in the total Army (10,198) and Marine Corps (13,326) buy from fiscal year 1987 on out.

Mr. **Chappell**. You have approximately 21,000 left to be produced, right?

General **Molinelli**. Yes, sir.

Mr. Chappell. And what is the efficient manufacturing rate?

General Molinelli. The present contractor can produce about 350-400 per month. Presently he is producing at a rate we gave him, a 250 per month rate. I think he is actually doing that now.

Mr. Chappell. And in 12 months, how many is that?

General Molinelli. In 12 months that is about 3,000 rounds.

Mr. Chappell. That leaves you about 15,000 yet to be produced, maybe 16-?

General Molinelli. Sir, I have those figures now. We are looking at 15,000 left to go for the Army, 21,500 for the Marines, so we are talking 36.5 thousand and 10,000 for the Navy, so we are talking 45,000 rounds, including the Marine Corps and the Navy five-inch guided projectile.

Mr. Chappell. How much commonality do you have between the Navy round and the Army round?

General Molinelli. I would guess, and I will provide for the record the actual number, but I would guess 2 to 3.5 percent commonality between the Navy round and——

Mr. Chappell. The commonality is about 5 percent?

General Molinelli. No, I will provide the actual number for the record, but we have an ongoing program with the Navy to increase the commonality, which would go with our second-sourcing acquisition strategy.

[The information follows:]

Copperhead has a total of 1116 electrical parts, 84 of which are common with the Navy 5 inch guided projectile for 7.5% commonality; whereas, the Navy 5 inch has 682 electrical parts, 63 of which are common with Copperhead for 9.2% commonality. This is an updated count from an earlier reply on the same subject by Secretary Marsh.

The Army estimates that it would take approximately 19 months for a second source producer of Copperheads to deliver its first round. Embedded in that time is the production parts and assembly leadtime for the current prime manufacturer. It would take an additional 17 months for this second source producer to prove out the production line and be at a rate of production which would be competitive with the current prime.

Mr. Chappell. How long will it take a new producer to come on line?

General Molinelli. Hazarding a guess at that point, I will provide the actual number for the record, but I believe that we are looking at about 18 months after award for the producer to come on line, the second-source producer to come on line.

Mr. Chappell. How long will it take you to get to the point where you would start them preparing to produce?

General Molinelli. I'm sorry, I didn't understand the question.

Mr. Chappell. In other words, it would take them how long to gear up to start producing if you had a new one ready to go right now?

General Molinelli. Well, we are talking about six months to get to the award selection, and probably 18 months beyond that until it begins to get a round off the end of the line.

Mr. Chappell. Say you had two years before you start getting a new round off the line, you have already reduced the total by about 85?

General Molinelli. By about 8400 rounds, yes, sir.

Mr. Chappell. So you are back down to about?

General Molinelli. Thirty-two thousand.

Mr. Chappell. Thirty-two thousand rounds?

General Molinelli. Yes, sir, 31.6, provided there is no change in the cap on Copperhead.

Mr. Chappell. You have no money in the budget for second——

General Molinelli. No, sir, funding for second source quantities was deleted during the OSD budget review.

Mr. Chappell. It just looks to me like where you are going, even if you were going to try to go the rounds yet to be done, it would be awfully difficult saving money on that kind of a deal.

We will put the remaining questions in the record, unless you have questions Joe.

Mr. McDade. Just one in closing, General. Check out that safety issue on the one-tenth that we talked about. I am advised that there is no such problem. It is a minor point and it has been long since disposed of.

I would appreciate it if you would look at that.

General Molinelli. Yes, sir. I will call you tomorrow.

Mr. McDade. Thank you.

Thank you. Mr. Chairman.

Mr. Chappell. Gentlemen, thank you very much.

General Molinelli. Thank you, Mr. Chairman.

[Clerk's note.—Questions submitted by Mr. Chappell and the answer thereto follows:]

Question. The budget includes $8.2 million for procurement of 200 Copperhead rounds. Last year you projected a fiscal year 1987 budget of $208.6 million. What accounts for the change?

General Molinelli. The change noted in the fiscal year 1987 budget request from the last year's project of $208.6 million to the current request of $8.2 million is a result of OSD direction after review of the Army's budget submission.

Question. How much was included in the Army's budget submission to OSD for Copperhead, and what reason did OSD give for reducing the amount?

General Molinelli. The Army's fiscal year 1987 budget submission to OSD for Copperhead was for $229.2 million for 6443 rounds. OSD review of this program noted a large undelivered production backlog which consisted of the fiscal year 1985 program of 5250 rounds, the fiscal year 1986 program for 6900 rounds and the request for 6443 rounds in fiscal year 1987. Further, while the fiscal year 1984 program deliveries then were being produced at a monthly rate of 233 per month and fiscal year 1985 was planned at over 300 per month, the fiscal year 1986/1987 program called for a rate of 700 per month. Additional facilitization, planned for by the prime contractor, was questioned by OSD. The contractor's facilitization schedule to reach the 700 per month rate was suspect. OSD directed a stretch of the fiscal year 1986 program deliveries over twenty months and reduced the fiscal year 1987 program accordingly. This has the effect of revising deliveries to approximately 350 per month in fiscal year 1986/1987.

Question. What is the current Authorized Acquisition Objective (AAO) for Copperhead and what was it last year?

General MOLINELLI. The current AAO with attrition of the systems is 164,000 rounds under P90E. Formerly, under P88E, it was 105,000 projectiles.

QUESTION. What accounts for the increase in the AAO from last year?

General MOLINELLI. The increase from P88E to P90E is due to two factors. First under P88E Copperhead was fired at tanks only whereas in P90E it was fired at all high value targets, e.g. tanks, personnel carriers, artillery pieces etc. Secondly, in P88E the only designator used were the Ground/Vehicular Laser Locator Designator, G/VLLD. In P90E both the G/VLLD and the Aquila aerial designator were played with Copperhead.

QUESTION. At what monthly production rate is Copperhead currently being produced?

General MOLINELLI. The current rate, under the fiscal year 1985 program now being produced by the prime contractor, is 250 rounds per month.

QUESTION. What is the economic production rate for which the contractor currently has facilities in place?

General MOLINELLI. The prime contractor is currently able to produce at a rate of 350–400 rounds per month. Facilities are sized and rated at 700 per month; however, the limiting factors to achieve this rate are machining operations and test equipment capacity.

QUESTION. Assuming a continued sole source procurement, what monthly production rate would be required to produce the fiscal year 1985 to 1988 programs within the regular funded delivery period?

General MOLINELLI. Three hundred and fifty rounds per month.

QUESTION. What additional investment in facilities would be required to do this?

General MOLINELLI. With this rate, 350 per month, there is no need for added facility investment.

QUESTION. What is your current estimate of the total number of rounds that must be procured to make second sourcing cost effective?

General MOLINELLI. Earlier internal analysis had estimated that the breakeven point varied between a low of 52,000 and a high of 90,000 rounds. These estimates are sensitive to various assumptions such as: learning rates, price reduction at onset of competition, second source investment cost, treatment of competitive influence on new contractor, inflation rate changes and other subjective market factors. During this past year the Army began to question the validity of these breakeven estimates. Contractor interests tend to point toward the lower Army estimate. Due to the uncertainty associated with the internal estimate, and the true unknown competitive market place estimate, the Army has structured a two phased second source approach. During the first phase the Army will consider responses to a competitive proposal to determine the market breakeven point in order to report to Congress on the cost effectiveness of establishing a second source. The Army's current estimate is that breakeven is above the current 31,000 round program and probably closer to the 50,000 round level than the 90,000 round level.

**Question.** What is the Army doing to develop a "fire and forget" Copperhead?

General **Molinelli.** The Army is not developing a "fire and forget" Copperhead per se; however, there is a technology effort which involves Copperhead and a potential autonomous seeker. In fiscal year 1987, the two color infrared seeker, originally started under the Guided Anti-Armor Mortar Program (GAMP), now under the Army TACMS program, will deliver a gun-hardened seeker which will be tested for a "proof of principle" demonstration in the 155mm howitzer. Integration work, beginning in fiscal year 1987, with Copperhead as the test bed, will result in the "proof of principle" firing in 2nd quarter fiscal year 1988.

**Question.** When might such a projectile be ready for production?

General **Molinelli.** If this particular seeker were continued in full scale engineering development a follow on "fire and forget" Copperhead could be available in fiscal year 1991 for production.

## LIGHTWEIGHT MULTIPURPOSE WEAPON

**Question.** The budget includes $82.5 million for 136,000 AT-4 lightweight multipurpose weapons and $2.5 million for 963,000 trainers. The AT-4 is a Swedish-developed shoulder-fire weapon to be used against lightly armored vehicles. Last year, the Army informed the Committee that it would procure 362,000 AT-4's over the next five years. Is the fiscal year 1987 budget consistent with this stated objective?

General **Molinelli.** No. The fiscal year 1987 budget reflects an OSD decision to compress the program into four years.

**Question.** How much was included in the Army submission to OSD for the AT-4?

General **Molinelli.** $53.4 million for 76K rounds.

**Question.** Why was it increased by OSD?

General **Molinelli.** OSD increased the program based on a production capacity of 165K rounds per year. However, since the Army opted for a 5 year profile and on shore production, FFV did not choose to facilitize for that number of rounds.

**Question.** What funding profile would the Army prefer for the AT-4? Provide dollars and quantities, by service, for the record.

General **Molinelli.** The desired [1] funding profile for all services is provided in the following chart.

| | K quantities/M dollars | | | | |
|---|---|---|---|---|---|
| | FY87 | FY88 | FY89 | FY90 | FY91 |
| Army | 76/54.3 | 79/59.2 | 75/58.1 | | |
| Navy | 20/14.0 | 38/26.4 | 24/17.0 | 24/17.5 | 24/17.7 |
| Marine Corps | 16/11.0 | 17/11.8 | 20/14.0 | 19/14.1 | 11/8.2 |
| Air Force | | | 5/3.4 | 5/3.5 | |

**Question.** Can the budgeted procurement quantity be produced within the funded delivery period on the existing facilities in

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[1] Services may sustain cuts or make changes during the development of their profiles within funding constraints.

Sweden? If not, how will the budget plan be carried out if approved?

General Molinelli. No. The deliveries would have to extend into the next delivery period.

Question. The Army also stated that 40 to 50 percent of the five year buy would involve domestic production by Honeywell. What are your plans for carrying this out?

General Molinelli. The Army is working with Honeywell to determine the feasibility of bringing production on shore. We have not yet made a decision on this issue.

Question. Do you plan to eventually have the capability to produce the entire AT-4 here? If not, why not?

General Molinelli. Honeywell has stated all of the AT-4 except the fuze and the base plate will be produced on shore. FFV of Sweden has the capacity to produce the additional fuzes and Honeywell will buy these off shore. The base plate is a proprietary item produced in Norway.

Question. How much is included in your budget to bring on domestic production of the AT-4?

General Molinelli. There is no money budgeted for AT-4 on shore production. The Army prefers that contractors self facilitize and then amortize that cost through procurement.

Question. What would be a reasonable funding profile for such an effort?

General Molinelli. Honeywell has given us an estimate of approximately $24 million.

Question. What specifically has the Army requested of Honeywell in the way of a proposal?

General Molinelli. The Army has not requested a formal proposal from Honeywell. We have asked them to provide an on shore production plan.

Question. Has Honeywell offered to establish domestic production at its own cost? If so, what are the details?

General Molinelli. Honeywell has indicated they would be willing to pay approximately $5 million of the $24 million they estimate facilitization to cost.

Question. Fiscal year 1987 is the last of three priced options which the government has with the contractor. For how many years after 1987 does the Army now include procurement funding for this weapon?

General Molinelli. Only one based on the decision by OSD. However, the Army would like to buy 362,000 rounds through fiscal year 1989.

Question. What is the procurement plan and strategy after fiscal year 1987?

General Molinelli. The Army plans to buy the balance of its 362,000 round requirement. We would prefer all of this balance to come from on shore production.

Question. Does the Army consider the AT-4 to be an interim weapon?

General Molinelli. Not really. The AT-4 is the best lightweight weapon available in its class, and is the Army's weapon of choice. We do expect technology to provide a lighter more versatile replacement, however, we don't expect this until the mid 1990's or beyond.

**Question.** What plans does the Army have to develop a replacement for the AT-4?

General **Molinelli.** The Army has a replacement in concept only. The Multipurpose Individual Munition (MPIM). We do not expect to see such a weapon until the mid 1990's.

**Question.** What will be the characteristics of the replacement?

General **Molinelli.** The Army's concept is to have a 10 pound weapon which can defeat light to medium armor as well as bunkers A soldier must be able to fire the weapon from an enclosed structure.

**Question.** How much is funded to develop and procure that replacement in the current 5 year budget?

General **Molinelli.** None.

## M483 155MM IMPROVED CONVENTIONAL MUNITION

**Question.** The budget includes $173 million for 441,000 M483 155mm Improved Conventional Munition rounds. Last year, Congress reduced this line by $30 million and stipulated that only $181.1 million of the $269 million appropriated could be obligated until the Army investigates current production problems and reports back to the Committee. What is the status of the Army's investigation and when will the report be submitted?

General **Molinelli.** An analysis of the production problems at the Mississippi Army Ammunition Plant (MSAAP) was directed by the Under Secretary of the Army during his 23 August 1985 visit to the plant. This analysis has been completed and a report will be forthcoming shortly.

**Question.** Is the Mississippi Army Ammunition Plant still experiencing difficulty in meeting production rates?

General **Molinelli.** Yes, but only in the Cargo Metal Parts (CMPTS) and Load, Assemble and Pack (LAP) facilities at the 20 thousand round per month rate. The projectile facility reached the target rate of 20 thousand rounds per month in January of this year.

**Question.** What is the nature of the problem?

General **Molinelli.** In both the CMPTS and LAP facilities, the major problem is equipment that does not perform according to specifications. In the CMPTS facility, the material handling system and the trim machines do not perform as they should. In addition the current deburring machines do not deburr the grenade bodies as well as subsequent operations require. In the LAP facility, the failure of the Grenade Assembly Machines (GAMs) to perform as specified is the major problem.

**Question.** A year ago, when General Harrison was asked how long it would be before Mississippi was a fully integrated production facility as intended, he replied, "Another year". What is your current estimate?

General **Molinelli.** MSAAP is currently capable of manufacturing projectile metal parts, cargo metal parts and loading, assembling and packing projectiles. The capability to accomplish these three functions makes it an integrated production facility. However, the inability of the cargo metal parts facility to produce at the one shift capacity of the projectile facility and the problems with GAMs in the LAP facilities restricts the overall output of the plant.

Question. General Harrison also stated that in April 1986, the Mississippi plant would reach a rate of 20,000 per month and start producing projectiles with costs more comparable to those of other plants. How do the costs of projectiles currently coming off the line compare to the $400 unit cost from other facilities?

General Molinelli. In February 1986, a completed round produced at MSAAP cost $827.51. Primary contributor to this high cost is the low producton rates in the CMPTS and LAP facilities.

Question. The Mississippi plant was designed and funded to have a 120,000 per month production capacity. What capacity does the plant actually have at this time?

General Molinelli. The current plant capacity is approximately 44,000 projectile metal parts, 225,000 grenades (2446 complete round equivalents), and 9,000 loaded, assembled and packed rounds per month. The grenade production number will increase to 950,000 grenades (10,326 complete round equivalents) by September 1986.

Question. What caused the shortfall?

General Molinelli. The shortfall was caused by a combination of: The complexity of the project, the employment of new and state of the art manufacturing techniques, changes to the projectile technical data package, failure of some major pieces of equipment to perform in accordance with specifications, reduction and/or deletion of project scope to reduce funding required and inadequate management. In addition, the cargo facility has some operations that are still being debugged.

Question. How much additional will it cost to provide a 120,000 per month capacity?

General Molinelli. That amount has not been determined. The current contractor estimate for facilities, equipment design and procurement, and project management to include fee and parts needed for debug is being evaluated. This estimate has been presented to the Army as a fixed price proposal by the contractor and is subject to negotiations. The target date for completion of negotiations is August 1986. The exact amount will be known then.

Question. How much additional investment does the Army intend to actually make?

General Molinelli. The Army is currently evaluating several options with respect to additional investments for Mississippi AAP. The options being costed and evaluated range from investing all funds required to bring Mississippi AAP to its design rate of 120,000 rounds per month to laying the plant away in its present configuration.

Question. A significant bottleneck in M483 production at Mississippi is the grenade assembly machines (GAM). Has a decision been made to replace these machines?

General Molinelli. Yes, two independent studies indicated that the GAMs had inherent design deficiencies and could never achieve the designed rate. A decision was made to replace these machines with existing technology machines of the latest design in use in operating LAP plants.

**Question.** How much will this cost?

General **Molinelli.** The cost estimate to replace the GAMs is $17.3 million.

**Question.** Last year's budget forecast production of 531,000 in fiscal year 1987 and about 900,000 per year thereafter. This year's budget request is 441,000 and the forecast for the outyears is closer to 170,000 per year. What accounts for the change?

General **Molinelli.** The lower quantity in fiscal year (FY) 87 is the result of several factors. Due to start-up problems at Mississippi (AAP), portions of the FY85 and 86 programs were diverted to Kansas and Milan AAPs, resulting in deliveries beyond the funded delivery period (FDP) at these plants. The FY87 program will be executed solely at Milan and Kansas. Coupled with a Marine Corps (MC) buy this quantity maintains these producers at 1-8-5 production rates. An increase in FY87 procurement would either force transition to multi-shift production or delay deliveries further out of the FDP. The decrease in procurement in FY88-91 reflects our limited munitions total obligational authority, coupled with an improved war reserve asset posture ——— compared to other priority munitions. With projected MC and foreign military sales, the FY88-91 levels are sufficient only to maintain a minimum warm production base (one producer).

**Question.** The outyear forecast represents less than 12 months production on a one shift basis at either Milan or Kansas Army Ammunition plants alone. Given this situation, can the Mississippi Army Ammunition plant be economically sustained as an active facility?

General **Molinelli.** No.

## MODULAR PACK MINE SYSTEM

**Question.** The Modular Pack Mine System (MOPMS) is a member of the Family of Scatterable Mines. The MOPMS box contains 21 mines which can be remotely emplaced. The Army proposed to use $15.6 million of a fiscal year 1985 unallocated Congressional add-on to initiate procurement. This was based on an expected type classification by September 1985. What is your current projection for type classification?

General **Molinelli.** The MOPMS Milestone III In-Process Review (IPR) was conducted on March 7, 1986. The IPR recommended that MOPMS be Type Classified Standard; Department of the Army approval of the IPR recommendation is expected by mid-April 1986.

**Question.** What problems were found during DT II and OT II, what solutions have been developed, and when will the solutions be tested?

General **Molinelli.** System functional reliability problems were discovered during testing which indicated a lower than required reliability in certain environments. The solution identified included changing specific electronic components and changing certain production processes. The corrections were demonstrated in limited validation tests and will be fully verified in a full scale Initial Production Test followed by a Special In-Process Review prior to fielding. Further details on the problems, solutions, and validation tests will be provided in the summary report which will be provided to the Committees in April 1986.

QUESTION. When will the committees receive the report on MOPMS tests as requested last year?

General MOLINELLI. A summary report of all MOPMS tests, the results and follow-on actions is being prepared now and will be provided to the committee by the end of April 1986.

QUESTION. What is the procurement profile and total cost of this program?

General MOLINELLI. The procurement profile for the MOPMS program is: ———.

QUESTION. What is the procurement strategy? What production facilities are funded or budgeted.

General MOLINELLI. The procurement strategy for the Modular Pack Mine System (MOPMS) will be to procure systems components within the Family of Scatterable Mines industrial base to the maximum extent possible, full and open competition for all non-industrial base components and to load, assemble, and pack the system at government owned ammunition production facilities. The MOPMS initial production facility is at the Lone Star Army Ammunition Plant in Texas. No additional production facilities are funded or budgeted.

QUESTION. When will the $15.1 million in fiscal year 1985 be obligated, and when will the $23.4 million in fiscal year 1987 be obligated.

General MOLINELLI. The fiscal year 1985 funds are to be obligated by September 1986 and the fiscal year 1987 funds wil be obligated in the 3rd Quarter fiscal year 1987.

## PRODUCTION BASE

QUESTION. For several years, the Committee has been concerned about the condition of the ammunition production base. In March 1984, the Army submitted a study which found that about $3.6 billion was required over the next 15 years to support production facilities for peacetime requirements, and an additional $55.1 billion was needed for mobilization requirements. In fiscal year 1986, a Congressional initiative funded $103.1 million to start this effort. The 1987 budget includes $161.1 million on this line. What is the status of the fiscal year 1986 program?

General MOLINELLI. Request for authorization to execute the appropriated funds is being processed by OSD.

QUESTION. In 1986, Congress specified individual projects to be funded. Are you carrying out the Congressional direction in its entirety? If not, why not?

General MOLINELLI. By Program Budget Decision, OSD substituted projects for those planned at inactive faciiities as they believe facilities at inactive plants should not be modernized in advance of active plants.

QUESTION. List the projects Army would fund if funds were provided on an unrestricted basis.

General MOLINELLI. The Army would fund the projects originally included in Senate Appropriation language and specifically targeted to correct deficiencies in existing mobilization base facilities. The list of projects follows:

| | Project | Amount |
|---|---|---|
| 155mm Metal Parts (MPTS) on Y Line | Louisiana | $3.0 |
| Power House | Radford | 39.8 |
| Continuous Nitrocellulose (NC) Manufacturing Unit 1 | Sunflower | 31.0 |
| M55 Loader Replacement | Iowa | 1.5 |
| Line Deficiency Corrections | Badger | 10.0 |
| Nitric Acid Concentration/Sulfuric Acid Concentration (NAC/SAC) Modernization | do | 10.7 |
| Correct Ammonia Oxidation Plant (AOP) Deficiencies | do | 1.4 |
| Fuze Production Equipment | Rexon/Bulova | 2.7 |
| 20/50 Brass Cup | Commercial | 3.0 |
| Total | | 103.1 |

**Question**. What were substituted?

General **Molinelli**:

| | Project | Amount |
|---|---|---|
| 5.56mm Tracer Changing Second Unit | Lake City | 2.7 |
| 5.56mm Blank-Second Unit | do | 1.5 |
| FASCAM Melt Pour Equipment | Commercial | 1.2 |
| Primary Overhead Electrical Dist System | Radford AAP | 13.4 |
| Mortar Test Assembly | Lone Star | 1.3 |
| Chucker & Bar Machine Plant Equipment Package PEP 0762 | Commercial | 2.1 |
| 155mm MPTS PEP 422 | do | 9.0 |
| Omnibus Design | Multiple | 11.6 |
| 20mm PGU-28B Raufoss Cartridges | Commercial | 9.0 |
| Oleum Sulfuric Acid Operational Deficiencies | Badger | 1.6 |
| Items less than $900,000 | Multiple | 1.2 |

Question: What are the 3 line items?

General **Molinelli**. Black Power at Indiana, TNT B Line Voids at Radford and Omnibus Engineering.

**Question**. Why is no funding shown on this line beyond fiscal year 1987?

General **Molinelli**. The limited TOA available to the Army and to the Procurement of Ammunition Army account has precluded funding of projects that are not required for peace-time production.

**Question**. Was this item in the Army's budget submittal to OSD?

General **Molinelli**. It was not.

**Question**. What rationale and guidance did OSD give in providing these extra funds?

General **Molinelli**. OSD include funds in fiscal year 1987 to partially redress shortfalls in mobilization deficiencies. Only projects at active facilities were considered.

**Question**. Provide for the record the projects that the Army would have funded if the funds have been provided on an unrestricted basis.

General **Molinelli**. The Army would fund the projects originally included in Senate Appropriation language and specifically targeted to correct deficiencies in existing mobilization base facilities.

**Question**. The "Provision of Industrial Facilities" line in the budget funds expansion of current capability, initial production facilities, and modernization of existing facilities. What does your

1987 "Production Base Modernization" line do that is different from this?

General MOLINELLI. It highlights the fact that projects strictly in support of future mobilization needs are programmed.

QUESTION. The Committee's specific interest over the years has been to fill voids in production lines which are now laid away but would be required for mobilization. How many of your 1987 projects address this deficiency?

General MOLINELLI. Black Powder, TNT Line voids correction, and M55 Detonator Loader Replacement, Items less than $900,000.

QUESTION. Last year, General Harrison stated that the Army had put in priority projects for $500 million per year to reduce mobilization deficiencies. How many of the projects in the first increment of your list are included in the production base modernization line?

General MOLINELLI. The list of projects submitted in the Justification of Estimates for FY 1987 for $103.1 million does not include any of the projects listed in the first increment of priority projects for $500 million per year to reduce mobilization deficiencies. The '86 program was based on projects with designs complete, which could be executable in the 1986 time frame. The 1987 program for $161.1 million includes three line items listed in the priority projects for $500 million per year to reduce mobilization deficiencies.

Black Powder at Indiana, TNT B Line Voids at Radford and Omnibus Engineering.

## RDX FACILITIES

QUESTION. Last year's conference bill stipulated that before any ammunition production base funding could be obligated, the Secretary of the Army must submit to the Committee a fully responsive plan for new RDX explosive manufacturing facilities. Earlier this year, Secretary Marsh testified that a proposed plan has been submitted to OSD for approval. When might this plan be submitted to the Committee?

General MOLINELLI. It is anticipated the plan will reach the committee in early April.

QUESTION. What are the elements of the Army plan as submitted to OSD?

General MOLINELLI. The plan addressses site specific work at Louisiana AAP, full funding and program plan.

QUESTION. What will be the capacity of the facility to be built at the Louisiana Army Ammunition Plant?

General MOLINELLI. 2.5 million pounds per month.

QUESTION. What will the Louisiana AAP facility cost, and when is it funded?

General MOLINELLI. The facility is estimated to cost $334 million with the first phase ($147 million) planned for fiscal year 1988.

QUESTION. What are the milestones for the Louisiana AAP project?

General MOLINELLI. Current funding for this project will require the following execution schedule:

| *Principal Milestones:* | *Date*[1] |
|---|---|
| a. Final Design (Request for proposal | Dec 87 |
| b. Construction Completed | Dec 92 |
| c. Prove-out begin | Jun 93 |
| d. Prove-out completed | Jun 94 |

[1] Note: The above date is contingent on FY 84 & 85 design funds release no later than May 86.

**Question.** What additional RDX facilities are included in the current five year budget?

General **Molinelli.** The current 5 year budget (fiscal year 1987 to fiscal year 1991) contains no additional RDX facility funding.

**Question.** Given current and projected peacetime requirements for RDX, how much production will occur at Holston, and how much at Louisiana, once the plant is finished?

General **Molinelli.** The following are projected peacetime requirements for RDX:

| Fiscal year: | *Million lbs.* |
|---|---|
| 1986 | 24.5 |
| 1987 | 24.9 |
| 1988 | 19.6 |
| 1989 | 19.4 |
| 1990 | 26.0 |
| 1991 | 23.4 |

After prove-out of Louisiana AAP peacetime requirements could be completed between the two plants on some ratio basis.

**Question.** How much production would occur at any additional plants that are built?

General **Molinelli.** Given the peacetime quantities it would be difficult to split the procurement to more than two producers. The remaining plants would be laid away for mobilization after prove-out.

[**Clerk's note.**—Subsequent to the hearing, the Army submitted the following report:]

DEPARTMENT OF THE ARMY
OFFICE OF THE UNDER SECRETARY
WASHINGTON D.C. 20310 0102

24 April 1986

Honorable Bill Chappell, Jr.
Acting Chairman
Subcommittee on Defense
Committee on Appropriations
House of Representatives
Washington, D.C. 20510

Dear Mr. Chairman:

This is in response to Public Law 99-190, December 19, 1985, Title III, Procurement of Ammunition, Army. That law requires "a specific funding and program plan for Research Department Explosive (RDX) modernization which responds to Congressional requirements on program phasing and direction concerning full funding, and which provides for initiation of site specific work at Louisiana Army Ammunition Plant (AAP) not later than June 30, 1986."

The specific plan (attached) of the Army to increase the RDX production base is:

a. Design a generic (site independent) 2.5 million lb/month RDX facility.

b. Site adapt the above design and prepare an Environmental Impact Statement (EIS) for an RDX plant for the Louisiana AAP.

c. Construct a 2.5 million lb/month RDX facility at Louisiana.

d. Site adapt design for Joliet and Alabama AAP.

e. Site adapt design for Indiana and Iowa AAP to the extent of funds available.

The appropriated and programmed RDX/HMX modernization program is attached and consistent with current DoD plans and the President's Fiscal Year 1987 Budget.

We consider the Louisiana RDX to be fully funded since the funds programmed in each of the three years, Fiscal Year 1988-1990, provide for completely operational functional facilities:

FY 1988 ($146.7 million) -- This project phase will provide a functional crude RDX manufacturing plant and the necessary support facilities. The support facilities consist of acid manufacturing and regeneration and industrial waste treatment facilities required for the operation of the crude RDX manufacturing plant.

FY 1989 ($117 million) - This project phase will provide a functional multi product finishing plant processing crude RDX into military grade explosives and its necessary support facilities. The supporting facilities include warehouses, maintenance buildings, production change houses, an explosive incinerator and a utility distribution system.

FY 1990 ($71 million) - This project phase will be for the balance of the support facilities and the integration and prove out of the two functional plants to optimize the RDX production. Supporting facilities included in this phase are igloos, utility system hook ups and production support buildings.

This modernization plan is based on the DoD Master Plan forwarded to Congress on May 21, 1984. That Master Plan, however, may be subject to changes as a result of Congressional authorization and appropriation actions, Gramm-Rudman sequestration, or internal DOD evaluations.

The Master Plan also contained a provision to establish a stockpile of RDX and HMX compositions as a hedge against any peacetime disruption of production and eventually as a supply of war reserves for mobilization. Congress has disapproved every budget request in this area. I cannot emphasize enough that the need to stockpile now is independent of actions on additional plants. I solicit your support of our stockpile requests, including that in the FY1987 budget request.

The Army can begin site specific work at Louisiana AAP within three months of the release of funds. The work will include topography examination, soil borings, design of bridges, roads and water supplies. Physical construction of the RDX plant is programmed in Fiscal Year 1988. The construction will be fully funded under fixed price turn key contract with 35% design complete at time of contract award. There are sufficient funds in the program to build an RDX plant at Louisiana AAP and design funds for the remaining facilities.

On 27 June 1985 forwarded a report to the Armed Services and Appropriations Committees (copy attached) which partially responded to House Report 98-1086. This letter provides the remainder of the response specifically paragraph c of the RDX/HMX Explosive Manufacturing Facilites section.

With submission of this plan the Army will execute the FY 86 Ammunition Production Base Program.

Sincerely,

James R. Ambrose
Under Secretary of the Army

Attachments

## ARMY PLAN
## RDX FACILITIES

| | | |
|---|---|---|
| DESIGN GENERIC 2.5M/LB MONTH RDX FACILITY | | FY84/FY85 FUNDS |
| SITE ADAPT LOUISIANA | | FY84/85 FUNDS |
| PREPARE EIS LOUISIANA | | FY84/85 FUNDS |
| CONSTRUCT 2.5M/LB MONTH RDX FACILITY LOUISIANA | | FY88/90 FUNDS |
| SITE ADAPT 2.5M/LB MONTH RDX FACILITY | JOLIET* | FY85 FUNDS |
| | ALABAMA* | FY85 FUNDS |
| | INDIANA* | FY85 FUNDS TO THE EXTENT AVAILABLE |
| | IOWA* | FY85 FUNDS TO THE EXTENT AVAILABLE |
| CONSTRUCTION | NONE | NOT FUNDED IN ARMY PROGRAM |

*RETAIN DESIGNS FOR CONSTRUCTION AT M-DAY

RDX/HMX MODERNIZATION PROGRAM $MILLION

| | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 |
|---|---|---|---|---|---|---|---|---|---|---|
| HOLSTON CONVERSION | | | | 26.6 | | | | | | |
| HOLSTON MOD/PROD | | 1.7 | 24.0 | 4.1 | 30.6 | 6.3 | 28.3 | | | |
| MUSALL PROCESS | 3.0 | | | | | | | | | |
| PILOT | | | 4.0 | 20.0 | | | | | | |
| FACILITY | | | | | | 12.1 | 77.2 | 123.0 | 100.3 | 75 |
| RDX BACHMANN LOUISIANA | | 19.5 | 10.0 | | | 146.7 | 116.0 | 71.0 | | |
| DESIGN RDX FACILITY - JOLIET | | | 10.0 | | | | | | | |
| DESIGN RDX FACILITY - ALABAMA | | | 10.0 | | | | | | | |
| DESIGN RDX FACILITY - INDIANA | | | 1.0 | | | | | | | |
| DESIGN RDX FACILITY FINISHING LINE - IOWA | | | 1.0 | | | | | | | |
| STOCKPILE | | | | | 35.0 | 36.1 | 35.6 | 35.5 | 12.3 | |
| TOTALS | 3.0 | 21.2 | 60.0 | 50.7 | 65.6 | 201.2 | 257.1 | 229.5 | 112.6 | 75.0 |

→ [illegible]

DEPARTMENT OF THE ARMY
OFFICE OF THE UNDER SECRETARY
WASHINGTON, D.C. 20310

27 June 1985

Honorable Jamie L. Whitten
Chairman
Committee on Appropriations
House of Representatives
Washington, D. C. 20515

Dear Mr. Chairman:

Reference is made to letters of June 29, 1984, and February 20, 1985, from Chairman, Subcommittee on Defense, Committee on Appropriations on the plan for improving our RDX/HMX production capabilities.

This letter augments the Secretary of Defense letter of April 19, 1985, which addressed the Army studies on RDX facilities and the reprogramming action on RDX/HMX stockpile by specifically addressing the concerns in the letter of June 29, 1984, and House Report 98-1086 which directed the following actions:

a. Propose to the committee specific sites for the location of the MUSALL pilot plant and the follow-on facilities for RDX and HMX manufacture.

b. Complete design and engineering for the MUSALL pilot plant to the point where construction costs are firm and fixed price contracts can be used for construction.

c. Provide a program/funding profile for the follow-on RDX and HMX manufacturing facilities which will allow: (1) fully funded construction increments which can stand alone in the event other increments are not funded; (2) design to be at least 35 percent complete before construction appropriations are approved; and (3) fixed price construction contracts.

d. Structure design and construction projects at Holston AAP so that each increment is fully funded and separable and can be undertaken using fixed price contracts.

e. Consider a larger number of small facilities than the plan now provides.

f. Consider accelerating construction of such plants, perhaps by using all or a portion of the funds now earmarked for stockpiling.

The enclosed report responds to paragraphs a, b, and d concerning the Holston AAP modernization program and the HMX MUSALL pilot plant. The remaining will be addressed separately after the conclusion of the cost effectiveness study of multiple sites for RDX production.

Unless otherwise informed, the Army will execute the FY85 projects for Holston AAP and the MUSALL Pilot Plant as appropriated.

My staff is available at your convenience to provide any additional information.

Sincerely,

James R. Ambrose
Under Secretary of the Army

Enclosure

DEPARTMENT OF THE ARMY
OFFICE OF THE UNDER SECRETARY
WASHINGTON, D.C. 20310

27 June 1985

Honorable Joseph P. Addabbo
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives
Washington, D. C. 20515

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Sincerely,

James R. Ambrose
Under Secretary of the Army

Enclosure

Copy Furnished:

Honorable Joseph P. Addabbo

DEPARTMENT OF THE ARMY
OFFICE OF THE UNDER SECRETARY
WASHINGTON, D.C. 20310

27 June 1985

Honorable Mark O. Hatfield
Chairman
Committee on Appropriations
United States Senate
Washington, D. C. 20510

Dear Mr. Chairman:

Based on your interest in the RDX/HMX program, enclosed is a copy of a report being forwarded to the Chairman, House Appropriations Committee, in response to questions raised in House Report 98-1086, dated September 26, 1985.

The enclosed report responds to questions concerning the Holston AAP modernization program and the HMX MUSALL pilot plant. The remaining will be addressed separately after the conclusion of the cost effectiveness study of multiple sites for RDX production.

My staff is available at your convenience to provide any additional information.

Sincerely,

JR Ambrose
James R. Ambrose
Under Secretary of the Army

Enclosure

DEPARTMENT OF THE ARMY
OFFICE OF THE UNDER SECRETARY
WASHINGTON, D.C. 20310

27 June 1985

Honorable Les Aspin
Chairman
Committee on Armed Services
House of Representatives
Washington, D. C. 20515

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Sincerely,

James R. Ambrose
Under Secretary of the Army

Enclosure

DEPARTMENT OF THE ARMY
OFFICE OF THE UNDER SECRETARY
WASHINGTON, D.C. 20310

27 June 1985

Honorable Barry Goldwater
Chairman
Committee on Armed Services
United States Senate
Washington, D. C. 20510

Dear Mr. Chairman:

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My staff is available at your convenience to provide any additional information.

Sincerely,

James R. Ambrose
Under Secretary of the Army

Enclosure

## HOLSTON ARMY AMMUNITION PLANT (AAP)/MUSALL HMX PILOT PLANT PROGRAM

A. Introduction:

(1) In May 1984, the Master Plan for initial RDX/HMX Planned Improvements was submitted to Congress in response to Conference Report 98-567, 1984 Defense Appropriations, November 18, 1983.

(2) Included was the planned funding profile (Appendix A).

(3) As a result of Congressional action in the FY 1985 Defense Appropriation Act and further Army/DoD review, study and design action, the following is the adjusted program currently envisioned for Holston AAP and MUSALL HMX Pilot Plant (Appendix B).

B. Holston AAP RDX to HMX Line Conversion: (FY 1986 $31.1M)

(1) This was proposed as a three year phased project in the Master Plan: FY84, $8 million; FY85, $20 million; and FY86, $1 million. Congress denied the FY84 reprogramming request and FY85 budget request because of insufficient design completed on the project. It has been resubmitted in the FY 1986 budget request as a single year project in the amount of $31.1 million.

(2) The project will reactivate by appropriate repairs, modifications and correction of safety and environmental deficiencies, all lines that are not specifically included in other planned modernization projects so that projected FYDP and stockpiling requirements can be accommodated.

(3) The specific elements of the scope of work of this project are:

(a) Reactivate Line 2 to manufacture Composition B.

(b) Modify Line 4 to produce PBX, Cyclotol and Octol.

(c) Modify Line 6 to increase HMX and RDX products production.

(d) Reactivate and modify acid facilities in Area B as required for production.

(e) Reactivate and modify utilities in Area B as required for production.

(f) Reconfigure Line 3 to increase capability to produce Composition A and provide capability to produce Octol and Cyclotol.

(g) Modify Line 5 to produce HMX products including the installation of a large HMX reactor.

(h) Reactivate and modify Line 7 for manufacture of Bulk HMX.

(i) Reactivate and modify utility lines, boilers and compressed air system as required.

(j) Provide materials handling and automotive equipment as required.

(4) This project has 35% completion of design with final design to be completed Dec 85. The construction contract will be firm fixed price.

(5) The construction for this project was authorized (MCA) in FY 1985 in the amount of $7.6 million.

C. Holston AAP Modernization/Productivity.

(1) The modernization and productivity enhancement projects by year are attached (Appendix C). Each of the projects are separate stand alone fully funded facilities and construction will be executed using fixed price contracts.

(2) Nitric Acid Support (FY84 $1.7M). This project will retrofit four 50 Tons Per Day (TPD) Ammonia Oxidation plants with extended absorption towers required to meet stricter pollution abatement requirements. Project design is completed and funds were appropriated in FY 1984. Construction began 3QFY84 and project will be completed in 3QFY86.

(3) Coal Handling Facilities (FY85 $9.0M). This project will provide a coal handling facility that will permit the use of less expensive coal and replaces obsolete and deteriorated equipment. The project will improve the coal receiving station, thaw house, active coal pile and its supporting equipment, crushers, dust suppression system, metal remover, scale feeder, coal transport conveyors, and their ancillary equipment. Design of this project was completed December 1984 and execution awaits release of funds.

(4) Line 8 Composition C-4 (FY85 $12.0M). This project modernizes the Line 8 facilities to produce Composition C-4. Currently the Composition C-4 recrystallization and drying operations are scattered in a number of buildings in different lines throughout the plant. This project consolidates the operations in a single line eliminating the interline transfer of Composition C-4. It also will improve the safety of Composition C-4 operations currently operating under safety waivers. The design will be 35% complete in April 1985 and final design will be completed September 1985.

(5) Productivity.

(a) FY 1985 Lacquer Preparation (FY85 $3.0M). This project provides for a separate building for lacquer preparation. Construction design was 35% complete in October 1984. Construction design was completed in March 1985.

(b) FY 1986 Automatic Palletization Emergency Electric Power Backup and Laboratory Testing (FY86 $4.1M). This FY 1986 project consists of three parts: the palletization, the power backup, and the laboratory testing equipment. No design is required for the testing equipment which is all off the shelf materials. Design for backup power is 35% complete with design completion scheduled for November 1985.

(c) FY 1987 Composition A-5 Drying (FY87 $2.4M). This project modernizes Holston's capability for drying Composition A-5 by installing a Wyssmont dryer. Currently A-5 is dried using bed dryers. The installation of the Wyssmont dryer will increase A-5 drying capability from 745,000 pounds per month to 1,265,000 pounds per month. Final construction design will be completed December 1985.

(d) FY 1988. Ammonia Oxidation Plant (AOP) (FY88 $2.7M). This project is proposed to replace several World War II vintage compressors in the Ammonia Oxidation Plant. These reciprocating compressors are over 40 years old and spare parts are no longer commercially available. The new compressors will be of the centrifugal type where spare parts are easily obtainable. A Project Development Brochure availability date of December 1985 is estimated with design completion by December 1986. No construction will be required.

(e) FY 1988. Final Sludge (FY88 $4.2M). This project is an effort to modify Holston's Spent Acid and Recovery (SAR) facilities. Its objective is to replace Sodium Nitrate with Ammonium Nitrate in the final sludge at reduced cost. As a result, dimethylnitrosamines, a known carcinogen, will be eliminated from the spent acid recovery discharge. This product can then be sold as fertilizer much easier than the present waste, aiding in cost recovery of this investment.

(6) Modernization Composition A Lines (FY87 $24.7M). This project will increase the capability to manufacture "A" compositions on Line. Additionally, the modernization effort will improve the safety of the "A" Compositions operations currently operating under safety waivers. The project will apply the latest technology available including continuous filtration and drying equipment, and automatic packaging and palletizing equipment to provide specially designed "A" Compositions manufacturing capability providing products at lowest possible costs. Construction design will be completed August 1986.

(7) Explosive Loading Dock (FY88 $3.6M). This project modernizes the loading dock facilities permitting palletization of finished explosives for off-site shipment. The explosive load limit for the new loading dock will be 250,000 pounds which will allow up to two full rail cars to be at the dock at any time. This dock will have a capacity of 22.4 million pounds per month. Final design will be completed November 1987.

(8) Modernization HMX/PBX (FY89 $24.1M). This project will provide modernized facilities for processing HMX compositions (Octol 5, LX 14. PBX [illegible] and PBX precoats for high volume Navy munitions. In addition, DMSO recrystallization facilities will be provided for production of HMX and fine RDX. This project will increase Holston capacity to produce PBX composition containing RDX and HMX.

D. MUSALL Process Demonstration. (FY83 $3.0M)

(1) Congress approved project release in October 1984. Contract was awarded October 1984 to Longhorn AAP in accordance with Congressional directive. This project will define the critical process parameters and program planning for the follow on projects. The parameters included are process reaction kinetics, material balances, and preliminary characterization of effluent streams. This program is on schedule. Equipment has been delivered.

(2) In addition program planning and site survey to identify the specific site requirements at Longhorn AAP to support the pilot facility will be developed.

(3) The process demonstration model of manufacturing 20 pounds per hour HMX will be completed on 1 November 1985.

E. MUSALL Pilot Plant (FY85 $4.0M; FY86 $20.0M).

(1) Congress approved $4 million of $21 million requested in FY 1985 for MUSALL Pilot Plant because of the delay in release of the MUSALL process demonstration. Consequently the FY 1986 budget request of $20 million would complete the funding for the project. The $4 million will be for the design of the plant utilizing data from the process demonstration project while the $20 million FY 1986 portion would construct and operate the plant.

(2) The MUSALL pilot plant will develop as a minimum the following process and technical data which will be used in the scale-up design of the MUSALL facility:

(a) Material and energy balance

(b) Process flowsheets, spare parts list, equipment design and material data sheets.

(c) Piping and instrumentation diagrams.

(d) Pilot plant operating log and recorded data.

(e) Standard Operating Procedures to include emergency shut down operation.

(f) Training manual/plan.

(g) Maintenance manual/plan.

(h) Process optimization plan.

(i) Demonstration test plan/report.

(j) Safety documentation such as Safety Site Plan, Hazard Analysis.

(k) Environmental plan.

(l) Process control systems to include on-line and off-line system.

(m) Adequacy of the pilot plant data for scale-up design.

(n) Characterization of recycle streams

(o) Determination of pollution abatement requirements

(3) This project will provide for timely submission of data to support the MUSALL facility design. The pilot plant project can also be used as a training tool to train government (or designated) key personnel to operate and maintain the MUSALL pilot plant for future optimization studies for MUSALL facility operations.

(4) This facility and operations project because of its nature is essentially developmental and will determine if HMX can be manufactured on a large scale production basis, consequently firm fixed contracts are not feasible. The facilities will be housed in current buildings and no construction is required.

(5) The facility will be located at Longhorn AAP as per Congressional directive.

(6) The design will begin July 1985 and installation of equipment will begin February 1986. Facility will be completed April 1987.

(7) The Pilot Plant will go through many configuration changes between April and December 1987, with the final configuration decision for the full scale facility based on the optimal configuration for production developed during this phase.

May 1984

### Funding Profile
### for
### Initial RDX/HMX Planned Improvements
(Million Then Year Dollars)

| | FY83 | FY84 | FY85 | FY86 | FY87 | FY88 | FY89 | FY90 | FY91 | Total FY83-91 |
|---|---|---|---|---|---|---|---|---|---|---|
| Holston AAP RDX to HMX Line Conversion | | 8 | 20 | 1 | | | | | | 29 |
| Holston AAP Modernization/Productivity | | 5 | 24 | 25 | 26 | 27 | 4 | | | 111 |
| HMX MUSALL Process Demonstration | 3* | | | | | | | | | 3 |
| HMX MUSALL Process Scale Pilot | | 21 | | | | | | | | 21 |
| 0.5M lb/mo HMX MUSALL Manufacturing Facility | | | 11 | 11 | 70 | 100 | 91 | 68 | 38 | 389 |
| 4.5M lb/mo RDX Bachmann Manufacturing Facility | | | | | | 38 | 149 | 116 | 71 | 374 |
| Stockpile RDX/HMX (150K lbs) | | 33 | 34 | 58 | 66 | 66 | 66 | | | 323 |
| | 3 | 67 | 89 | 95 | 162 | 231 | 310 | 184 | 109 | 1250 |

*The Joint Conference Report 98-567 directs that neither the Department of Defense nor the Army reprogram any prior year or fiscal year 1984 funds to verify the new HMX chemistry production process without the Consent of the Committees. The $3M in FY83 for verification of the new HMX chemistry process is withheld pending Consent.

C-2

UNCLASSIFIED

BEST COPY AVAILABLE

RDX/HMX MODERNIZATION SUMMARY $MILLION

| | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 |
|---|---|---|---|---|---|---|---|---|---|---|
| HOLSTON CONVERSION | | | | 31.1 | | | | | | |
| HOLSTON MOD/PROD | | 1.7 | 24.0 | 4.1 | 27.1 | 6.3 | 28.3 | | | |
| MUSALL PROCESS | 3.0 | | | | | | | | | |
| PILOT | | | 4.0 | 20.0 | | | | | | |

## HOLSTON MODERNIZATION/PRODUCTIVITY SUMMARY

| $M | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 |
|---|---|---|---|---|---|---|---|---|---|
| NITRIC ACID SUPPORT | 1.7 | | | | | | | | |
| COAL HANDLING FACILITIES | | 9.0 | | | | | | | |
| LINE 8 COMPOSITION C-4 | | 12.0 | | | | | | | |
| PRODUCTIVITY | | 3.0 | 4.1 | 2.4 | 2.7 | 4.2 | | | |
| MODERNIZATION COMPOSITION A LINES | | | | 24.7 | | | | | |
| EXPLOSIVE LOADING DOCK | | | | | 3.6 | | | | |
| MODERNIZATION HMX/PBX LINES | | | | | | 24.1 | | | |

## 120mm Tank Ammunition

**Question.** The budget includes $247.4 million to procure four different rounds of 120mm ammunition for the M1A1 tank. This ammunition was developed in Germany, but is now being produced in this country. Deliveries of this ammunition have just begun within the last year. What are the results of first article tests to date? What technical problems remain?

General **Molinelli.** First Article tests have been successfully completed for the M829 cartridge and all components and for the M831 cartridge and all components. First Article tests for the M865 cartridge and components have been completed, but there are some technical problems (see below). First Article tests for all components, including the M764 fuze for the M830 cartridge, have been successfully completed. First Article tests for the M830 cartridge are in process with expected completion in April 1986. Remaining technical problems are primarily with the M865 cartridge. Further testing is required by TECOM and AMSAA to demonstrate that system safety is not compromised by the potential for late-burning propellant. Tests are in process with expected completion by June 1986. Interim use of the M865 cartridge requires a four second minimum delay between rounds. Dispersion performance for the M865 has not been satisfactory. Tests in process for improved dispersion will be completed in April 1986.

**Question.** To date, this ammunition has been procured sole source through a system prime contractor, Honeywell. What are plans for fiscal year 1987 and beyond?

General **Molinelli.** Initially two second source candidates will be selected in mid-FY86 with a bid-off in FY87. The winning second source candidate will be awarded a contract for a small educational buy for FY87. FY88 will be competed between Honeywell and the second source, as will remaining out-year buys.

**Question.** Provide for the record the specifics of your program strategy and second source implementation plan, including milestones.

General **Molinelli.** Two second source candidates will be selected competitively and awarded contracts by June 1986. A small quantity of 120mm cartridges (approximately 40,000) will be set aside for the second source in FY87. A solicitation restricted to the two second source candidates will be issued with proposed award to the winner in February 1987 for delivery of the set aside quantity. Honeywell, Inc. will be awarded the remaining FY87 quantity on a sole source basis. In FY88 a restricted solicitation will be competed between Honeywell, Inc. and the second source producer with split awards, if economical, in January 1988.

**Question.** Does your current five year budget support dual sourcing of this ammunition?

General **Molinelli.** Yes, yearly production quantities in excess of a yearly total of 150,000 have been judged to be sufficient to maintain two producers.

**Question.** Why have you elected to stay with a prime contractor rather than break out the components and "workload" existing production facilities as you do with other ammunition?

General **Molinelli**. The system approach for 120mm ammunition production was maintained to reduce risk to the very ambitious delivery schedules dictated by the M1A1 tank. To change methods of procurement during the initial production years and risk non-delivery of ammunition, was thought to be neither prudent nor cost effective. Existing production facilities are being used by the current prime contractor, and will continue to be utilized in the future.

**Question**. What will it cost to establish a second system contractor?

General **Molinelli**. Current estimates reflect a cost of approximately $6M required to establish a second system contractor.

**Question**. The cost of 120mm ammunition is several times the cost of corresponding ammunition for 105mm tank guns. What are you doing to bring prices down?

General **Molinelli**. Four major initiatives are being undertaken to reduce the price of 120mm ammunition. These are: a. Significant cost savings are anticipated by the implementation of competitive system contracting. While the maintenance of completion through two primes will require premiums, the pressures of the market place will provide cost savings far in excess of the premiums. b. Both contractors will be allowed maximum flexibility to change the designs to reduce costs. Recent experiences with this strategy have produced significant unit price reductions. c. Both contractors will conduct (in the case of Honeywell Inc. this program is underway and producing results) an extensive value engineering program structured with major cost reducing goals and incentives. d. Not to exceed unit price targets will be established for each year, for each cartridge. These targets will become contractually binding on the prime contractors in FY88 (first year of full and open competition). Targets will be achievable but will represent a significant and progressive cost reduction from year to year.

**Question**. What specific cost goals to you have for each of the rounds for fiscal year 1987, 1988, and 1989?

General **Molinelli**. A range of target costs per round has been tentatively established as an objective of the second sourcing strategy. These ranges are based on utilization of an 85% learning curve for the FY87 buy a target learning curve of 80% due to competition. These figures also consider the premium paid in FY87 for bringing on the second source and should be interpreted in program year dollars.

| | FY1987 | FY1988 | FY1989 |
|---|---|---|---|
| M829 | $1.260-$1.208 | $1.101-$1.072 | $1.106-$1.047 |
| M831 | 1.097-1.048 | 930-886 | 865-679 |
| M865 | 645-594 | 542-504 | 512-463 |

[Clerk's note.—End of questions submitted for the record.]

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WEDNESDAY, APRIL 16, 1986.

# COMMUNICATIONS, COMMAND AND CONTROL OVERVIEW

## WITNESS

HONORABLE DONALD C. LATHAM, ASSISTANT SECRETARY OF DEFENSE, COMMAND, CONTROL, COMMUNICATIONS AND INTELLIGENCE

## INTRODUCTION

Mr. DICKS. Today the committee will hold hearings on the communications, command, and control programs of the Department of Defense.

This is an area that has received increasing attention in recent years as a critical component of the defense effort.

The budget request this year continues to give a relatively high priority to these programs. The total budget request for communications, command, and control for the Department of Defense is $24.4 billion. That is $3.7 billion, or 18 percent above the fiscal year 1986 level.

This morning the committee will hear from Secretary Donald C. Latham, Assistant Secretary of Defense for Command, Control, Communications, and Intelligence.

This afternoon we will continue to focus on this area with witnesses from the Services and the Defense Communications Agency.

Secretary Latham has appeared before the committee on numerous occasions.

Your entire prepared statement will be placed in the record, Mr. Secretary. You may proceed.

## SUMMARY STATEMENT OF MR. LATHAM

Mr. LATHAM. I would like to share with you my usual vugraphs and summarize the area. I would like to start out by showing you a couple of rather startling vugraphs having to do with the joint net assessment of where we are relative to the Soviets.

[CLERK'S NOTE.—Classified slide removed.]

## NET ASSESSMENT

First is a plot of the percent increase in Soviet spending as a function of time. Look at the comparison in what we believe is the actual defense spending budget of the Soviet Union versus their announced spending budget.

Their official announced spending is here at the level of 100 million rubles. The next vugraph, shows actual spending, so we are looking at, in 1985, something like a ——— percent increase in what they are actually spending on defense versus what they advertise.

Mr. Dicks. How do we know that?

Mr. Latham. These data are dervived from a brand-new DIA document that came out in March of 1986, an analysis of Soviet spending in terms of increases from 1970 to 1985.

[Clerk's note.—Classified slide removed.]

The next one shows the currency in billions of rubles. Here is the announced number, here is the actual defense spending and the state budget and GNP. The difference in rubles is subtantial in terms of equivalent dollars, and the percent of their GNP they are spending ranks from a low of probably ——— percent of GNP.

Mr. Dicks. Do they get more bang for their ruble than we do for our bucks.

Mr. Latham. In a sense, they do in that their soldiers' pay is substantially less than what we pay our people so they can have a conscript in the service for less rubles per month.

Also the salaries they pay their engineers and other people, technicians in their industry, are substantially less than ours, but they also support on that level of money a very much larger force than we do as a result.

[Clerk's note.—Classified slide removed.]

This is a document, the recent NIE, that compares the strategic command and control and communications area of the Soviet Union and ourselves. This is a snapshot taken in peacetime during the initial phases ———. These are the subitems under each category.

In the peacetime posture and initial phases in many areas, the U.S. ———. However, when you go into the case of the initial phase of the war and then down into the ———. Some of it is moving towards the even category, but when you look here in terms of where the lead is going, that the lead in 1995, where it counts if we did get into a shooting match with them, the Soviets have ——— of the CIA and DIA estimates.

This is ———, and what have you in this particular document. So where it really counts———

Mr. Dicks. Does this assume that they are going to strike first?

Mr. Latham. Yes.

Mr. Dicks. With nuclear weapons?

Mr. Latham. With nuclear weapons. Yes, sir.

Mr. Dicks. Does this assume that we have retaliated against that?

Mr. Latham. Yes, it would be so. When you make estimates on survivability it assumes that there has been an exchange that they have gone first. In the areas of survivability and connectivity and endurance, in this area the Soviets have spent more rubles or dollars ———.

Mr. Dicks. Because so much of their force is land-based ICBMs and they really do have a little bit easier———

Mr. Latham. Command and control problem. That is true, but as you know, they are moving to ———. So it is beginning to somewhat balance out, but the preponderance of throwweight in RV's are in the land-based force.

Let me turn to a few of the major C31 programs.

[illegible] AVAILABLE

## STRATEGIC PROGRAMS

First in the strategic program area we have a number of initiatives underway.

[Slide follows:]

# MAJOR STRATEGIC $C^3$ INITIATIVES

- TACTICAL WARNING AND ATTACK ASSESSMENT (TW/AA)
  - NEW TW/AA ARCHITECTURE
  - OTHB - ALL CONUS COVERAGE
  - BMEWS UPGRADES
  - TWO NEW/UPGRADED PAVE PAWS
  - DELETED
  - BOOST SURVEILLANCE TRACKING SYSTEM (BSTS) STUDIES

- STRATEGIC COMMUNICATIONS AND SUPPORT
  - DSCS III MULTIYEAR
  - MILSTAR IN FSED
  - GWEN BEING DEPLOYED
  - ELF SYSTEM IN FSED
  - MRT LF/VLF RECEIVER
  - E6A AND COMM SUITE
  - WIDEBAND EHF
  - GPS/NDS IN PRODUCTION
  - JRSC TERMINALS
  - NETS

2146.H87677.9

Mr. Latham. I will touch on a few of these. The over-the-horizon back scatter radars are being deployed. The BMEWs are being upgraded, phased arrays at two of the sites, probably all three, the computers have been upgraded.

We are putting in new PAVEPAWS, two, one in the Southeast, one in the Southwest. The two existing PAVEPAWS are being upgraded so we will have four on line in ———.

Mr. Dicks. Are these consistent with the ABM treaty?

Mr. Latham. Yes.

Mr. Dicks. That has been an issue with the Soviets.

Mr. Latham. It has. They have questioned that these PAVEPAWS radars are in violation of the treaty. The U.S. says these are within the complete legal interpretation of the treaty ———.

Mr. Dicks. Has that been delayed because of the shuttle?

Mr. Latham. Yes and no.

The next launch is ——— and it is on an expendable launch vehicle. The next one was to be in ———.

In the communications area, the most impressive program in terms of dollars and technology is MILSTAR. It is in full-scale engineering development. The satellite will go through ———.

The first launch of MILSTAR is scheduled for ———. The first two MILSTAR packages———

Mr. Dicks. What will that give us?

Mr. Latham. That gives us an absolutely unique capability.

First of all, it gives you global connectivity to the entire globe. The way the satellites will be put into orbit and the way the constellation will be, it is ———. We will be able to use these to communicate to and from the bombers and submarines anyplace in the world. The MILSTAR satellites are the most ——— we have ever built.

They will have a very large capacity for communications. The MILTARs are operated at a frequency called EHF, an extremely high frequency, so we go up to the satellite at ———.

The DSCS operates at SHF frequencies, below 10 gigahertz. So this is a very different type of system. This is also a "switchboard in the sky" allowing us to point a beam here or there and hook up numerous subcribers, all secure like a complex switchboard in the sky.

Mr. Dicks. That will have linkage with the airborne command post and with TACAMO?

Mr. Latham. Yes. TACOMO will have MILSTAR capability and this constellation of satellites is the first to be operationally controlled ———.

GWEN, the Ground Wave Emergency Network is a major initiative. The ELF system is for the submarines with operational use in ——— operational already. These are the Miniature Receive Terminals (MRTs) going on B-1 bombers and eventually ATB's.

Here is E-6A, moving along well so far. The wide band EHF is a new initiative to provide more capability at EHF than ———. These are the jam resistant secure communications terminals. ——— have been produced to operate with DSCS and are being deployed.

[Slide follows:]

# MAJOR STRATEGIC $C^3$ INITIATIVES

- COMMAND AND CONTROL
  - FOUR E4B NECAP
  - MODERNIZED WWABCC PLATFORMS
  - CINC MOBILE COMMAND CENTERS
  - HEMP HARDENING OF ALL CRITICAL NODES
  - SPECIAL STUDIES

- RELATED PROGRAMS: SDA-2000
  - STRATEGIC DEFENSE INITIATIVES (SDI)
  - NORTH AMERICAN AIR DEFENSE (NAAD)
  - SPACE DEFENSE

2146-H67677.12

Mr. **Latham**. In the command and control area we have four NEACP aircraft available, they are based inland. One aircraft is always on ——— alert. We believe on any given day we could have ———.

We have initiated a mobile command center program and are hardening the various C$^3$ nodes noted here. There are a number of studies underway looking at additional survivable systems concepts such as ———.

In the strategic defense area, that is handled under SDA 2000, Strategic Defense Architecture 2000.

General Herres is the driver, and is looking at defense against ballistic missiles, North American air defense against air-breathing threats and space defense, as an integrated air defense space and missile defense complex. We are intergrating these together under what I will call a strategic defense initiative.

[Clerk's note.—Classified slide removed.]

One of the major communications initiatives for strategic support is called the Ground Wave Emergency Network or GWEN. I call this an overlay to the telephone system. The telephone system which carries the majority of our command and control and other types of messages today is not deemed survivable in a nuclear war. We are trying to build a highly survivable system at very low cost that will provide us the capability to use the system to send force direction messages, emergency action messages and other things from the force commanders to the actual weapon systems themselves.

We are wiring it up such that you can inject into the network via UHF. What you are going to have with GWEN is a packet switched network—it is a series of radio towers and I will show a picture—that transmits and receives low data rate messages at frequencies of ———. You can maintain connection at UHF from external sources such as airborne command posts. As a result we will have connectivity from airborne command posts, ground mobile ground posts at UHF into GWEN and then GWEN relays the messages at low frequency.

There are numerous towers being deployed across the United States that interconnect launch control centers, air bases and so on together.

Mr. **Dicks**. One of the issues you keep telling us about is that the Soviets are hardening their command centers. Are these things hardened?

Mr. **Latham**. ———.

Mr. **Dicks**. Are we doing that?

Mr. **Latham**. No.

Mr. **Dicks**. Why not?

Mr. **Latham**. Very expensive; takes a lot of land and an awful lot of money.

Mr. **Dicks**. Do you think the ——— gives us a comparable capability?

Mr. **Latham**. I think so. The Soviets have been building deep underground facilities since right after World War II and as a result they have spent ———, so the amount of treasure they put into that is enormous.

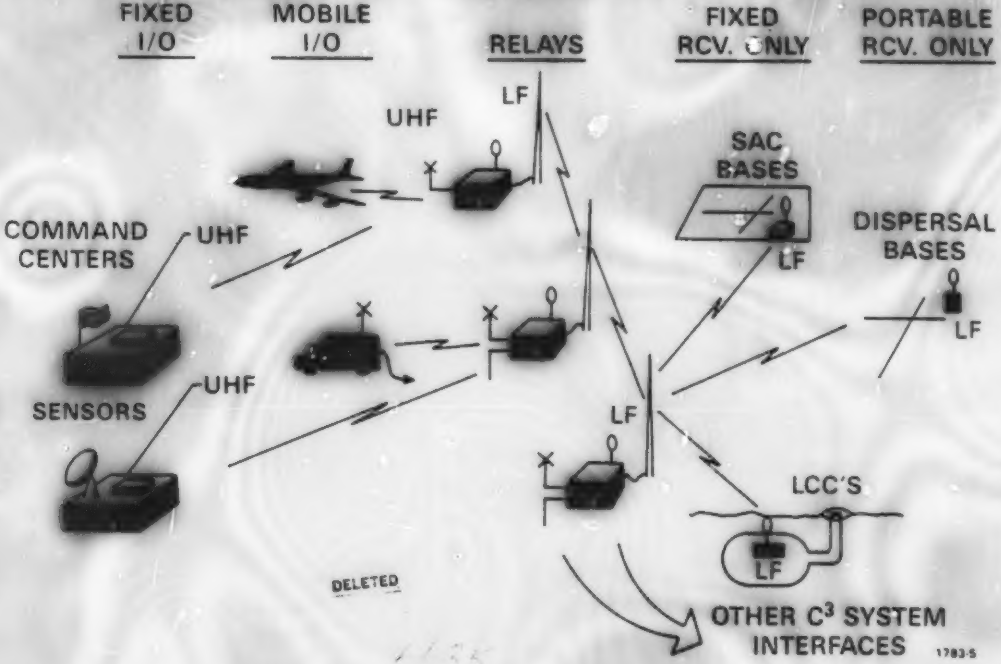
We can't afford it, so we have resorted to things like mobility, redundancy and concealment and reconstitution to build a survivable system.

Mr. DICKS. When does this go into effect?

Mr. LATHAM. It has already started. This is an artist drawing of a node.

[Slide follows:]

# GWEN TERMINAL LOCATIONS AND CAPABILITIES


FIXED I/O
MOBILE I/O
RELAYS
FIXED RCV. ONLY
PORTABLE RCV. ONLY
UHF
LF
COMMAND CENTERS
UHF
SENSORS
UHF
LF
SAC BASES
LF
DISPERSAL BASES
LF
LCC'S
LF
OTHER C$^3$ SYSTEM INTERFACES
1783-5

DELETED

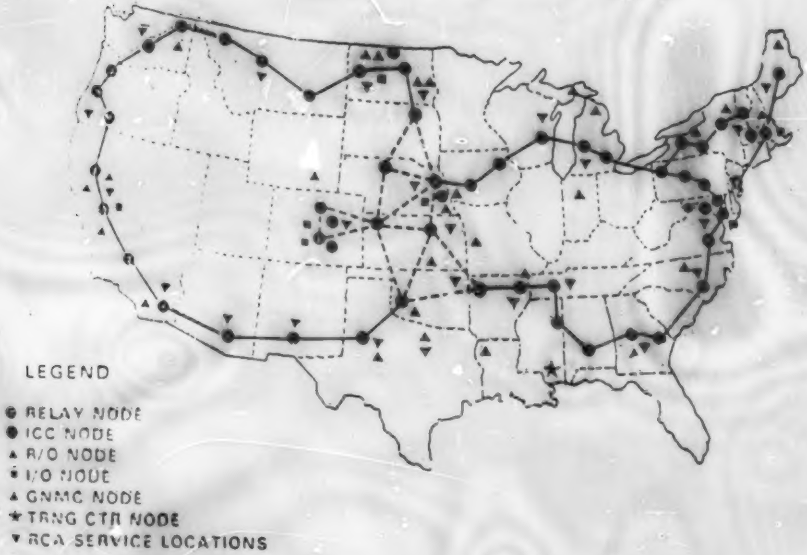
**Mr. Latham**. The actuals look like it. You have a small shelter next to a tower two to three hundred feet high. There are approximately 12 acres of land involved and you have a diesel generator there allowing you to have a couple of weeks of power if the commercial power is lost. It is a very obscure small site located typically in remote areas.

These are put away from population centers. There has been a lot of controversy about GWEN in certain parts of the country, for example in Massachusetts where they say you are going to cause the start of a nuclear war by putting these in. We have met several times with concerned citizens.

We have answered that challenge in a number of town hall meetings, and except for Amherst, Massachusetts, we have won most of the cases.

[Slide follows:]

# GWEN TLCC NETWORK CONFIGURATION



LEGEND

- ● RELAY NODE
- ● ICC NODE
- ▲ R/O NODE
- ▪ I/O NODE
- ▲ GNMC NODE
- ★ TRNG CTR NODE
- ▼ RCA SERVICE LOCATIONS

Mr. LATHAM. You ask when is it going in. We are already starting. There are ten nodes in and operating and these ———.

[CLERK'S NOTE.—Classified slide removed.]

These are the dollars for GWEN. For 1987 it is $162 million and here are the specific IOC dates for the GWEN system. We IOC for the Phase II thin line system in ———.

### ATTACK WARNING AND ATTACK ASSESSMENT

Let me talk about the attack warning and attack assessment area.

[CLERK'S NOTE.—[illegible]assified slide removed.]

There are a number of initiatives underway. We have talked about the ———, BMEWS, the PAVEPAWS, and the space track radar systems that are used for tracking space objects.

There is the joint surveillance system with the FAA for air surveillance of air-breathing threats, the over-the-horizon backscatter radar and then the North warning system.

All these initiatives are funded and underway. The master schedule plan we have, and this shows additional things happening.

[CLERK'S NOTE.—Classified slide removed.]

The basic message is that by the end of the decade we will have most of these in IOC and in the early nineties we will have FOC of most of these initiatives. It is a major upgrade to the NORAD facilities, SAC facilities and to all the various sensors and communications systems that support the warning problem.

Mr. DICKS. We are spending a lot of money making a big effort. You have made this a top priority of this Administration. When you get down to 1991, how are we going to stand vis-a-vis the Soviets?

Mr. LATHAM. That is a very good question. You could break that into several questions.

We are going to have to continue to spend about this level of money for the next several years. My guess would be, and when I show you the resource numbers, we will have been over the hump in the major aspects of our modernization effort by ——— time frame in both the strategic and tactical areas.

We will have bought out and modernized the force in both strategic and tactical. I would see a phasedown in procurement levels. We are at $8.5 billion in FY-87 of the 24.4 for procurement.

My projection is that the procurement will go through ———, and then start to decrease. Vis-a-vis the Soviets in 1991 with the additions of things like MILSTAR and GWEN, we will have a more robust and survivable system from a connectivity, command and control point of view than he does ———.

Mr. DICKS. Are we going to get into that today?

Mr. LATHAM. No. You had a special hearing on that last week. By the ———, then we will have a very survivable and capable command and control system.

Now you could ask the question, what about the intelligence piece? We have a superb system ———.

We are working that, but it is a very long-term problem to fix.

Mr. DICKS. Does that determine our satellites now?

Mr. LATHAM. Yes, things like ———, and so on.

## STRATEGIC BOMBER WARNING

Let me talk about strategic bomber warning. The Soviets have ———, the BlackJack aircraft. They have other aircraft, Backfires, in production at 30 a year. They are producing brand-new Bears armed with air-launched cruise missiles.

[Clerk's note.—Classified slide removed.]

They are deploying SLCMs on submarines. We suspect they will do it on surface ships. As a result, in the total air defense program area we are looking at cruise missiles surveillance technology, atmospheric surveillance technology with a number of projects and we are ———.

Mr. Dicks. Let's talk about that a minute.

Are you talking about using these—against the Soviet bombers?

Mr. Latham. Bombers and cruise missiles.

Mr. Dicks. Give me an idea what you are talking about.

Mr. Latham. Hypothetically, one of the possibilities for a ———.

Now there is a detection problem against cruise missiles, and especially against stealthy cruise missiles. There must be a companion sensor program and some of the sensors being developed in ———.

Mr. Dicks. These would be ground-based sensors?

Mr. Latham. No, ———.

Another thing we are looking at is a space-based radar. There are a number of possibilities in the nineties and 2000 that may have applicability to this area.

It is too early to say, but the air defense problem of CONUS is a serious problem. If we perfect a capable ———. attack the ground-based components of everything.

So we have to develop a companion defense system to handle the air-breathing threat, and in addition, we have to develop a space-based defense system. That is what the SDA-2000 thing does; it integrates all three of the problems into a major initiative.

You hear a lot about the SDI piece. This piece is equally important and we are moving ahead on components like over-the-horizon radars, North warning, additional F-15's ans so on.

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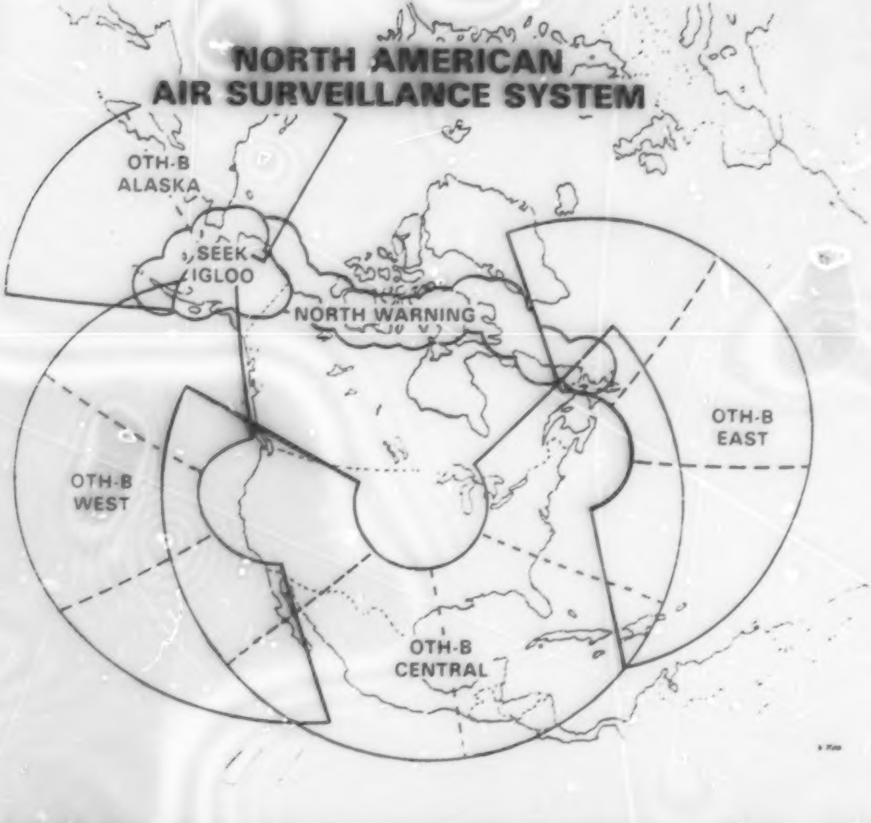


NORTH AMERICAN AIR SURVEILLANCE SYSTEM

OTH-B ALASKA
SEEK IGLOO
NORTH WARNING
OTH-B WEST
OTH-B EAST
OTH-B CENTRAL

## OVER-THE-HORIZON BACKSCATTER (OTH-B) RADAR

Mr. **Latham**. The first initiative is the Over-The-Horizon Backscatter (OTH-B) radar. This is to detect and track both bombers and cruise missiles.

One of the problems with these kinds of devices is there is———.

This Eastern system has one sector almost completed, two more sectors to go in. This will go on line in ———. This will go on line in ———.

Mr. **Dicks**. Explain to me why that isn't a violation if it is not on the periphery of the country?

Mr. **Latham**. It is on the periphery. This one is at Moscow, Maine, sitting right in the middle of the boonies looking outward.

The Soviets have huge over-the-horizon backscatter radars in operation today and have had for years. They use this technology to track aircraft and to look over our ballistic missile fields to detect ICM launches.

[Clerk's note.—Classified slide removed.]

The question is, what can you do with those against ———.

[The statement of Mr. Latham follows:]

# STATEMENT BY THE ASSISTANT SECRETARY OF DEFENSE COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE

## I. INTRODUCTION.

Mr. Chairman and Members of the Committee, it is again a privilege to appear before you to present the Department of Defense's (DoD) request for funding for Command, Control, and Communications, or $C^3$. An essential element of our military structure, $C^3$ systems are the critical information and control links necessary to support command decision making and manage our forces during peacetime and periods of conflict. Without the capabilities that properly designed $C^3$ systems provide, our forces cannot be effectively utilized.

Several years ago when I first appeared before this subcommittee, my presentation focused on the substantial deficiencies which existed in the capabilities of our $C^3$ systems and our plans for correcting these deficiencies. Many of the principal initiatives for resolving these deficiencies and, in turn, improving the capabilities and survivability of our $C^3$ systems were embodied in the President's Strategic Modernization Program. In response to this appeal, Congress demonstrated their support by providing the funding necessary to begin the modernization of our $C^3$ systems. Since that time, the ability of our $C^3$ systems to support our forces and weapons systems has significantly increased as a result of this investment of fiscal resources and the intensified management of programs. Tangible improvements have been realized not only in our strategic $C^3$ systems, but also in our theater and tactical, electronic combat and defense-wide $C^3$ systems. We intend to continue following this course of eliminating identified weaknesses and continuing the acquisition activities necessary to take full advantage of opportunities. At the same time, this period of increasing fiscal austerity places further emphasis on attaining the most effective allocation of limited resources to ensure maximum benefit from the modernization effort.

Today, my presentation covers not only the substantial progress we have made in improving our current $C^3$ capabilities, but also the strategy and activities necessary to develop and field future $C^3$ systems. Although intelligence programs are outside the scope of today's presentation, the information and capabilities provided by them are essential elements in achieving an effective $C^3$ capability. We place an equal priority on our intelligence programs and view them as an important part of an integrated $C^3I$ systems package needed to effectively support the National Command Authorities (NCA) and our forces.

## II. $C^3$ STRATEGY AND GOALS.

Our strategy of deterrence of war through the defensive use of military power requires our military forces to react quickly if an enemy takes the first initiative. This commitment places a heavy reliance on $C^3$ systems that are capable of rapid and effective force management. To be successful, $C^3$ systems must provide the means to quickly transform individual, widely dispersed units into an integrated, effective force. These systems must satisfy the needs of all echelons of the forces to observe, provide warning, assess adversary intentions, collect and process information on the status of our own and hostile forces, support decision making, and communicate decisions to the forces.

In view of this strategy and corresponding requirements, our $C^3$ programs are guided by and directed at fulfilling the following goals:

(1) The capabilities and survivability of $C^3$ and associated systems must match those of the forces they support.

(2) Development and acquisition of $C^3$ capabilities must have the same priority as the weapons and other systems they support.

(3) $C^3$ systems must have the connectivity, survivability, security, and interoperability necessary for effective joint and combined operations.

(4) Reliable, secure, and survivable $C^3$ must be maintained between the NCA, Joint Chiefs of Staff (JCS), nuclear Commander-in-Chiefs (CINC's), and strategic forces.

(5) $C^3$ systems must be secured by such means as necessary to prevent the compromise or exploitation of classified information.

(6) We must have a balanced $C^3$ countermeasures ($C^3$CM) capability to degrade enemy $C^3$ and protect our own $C^3$ from enemy countermeasures.

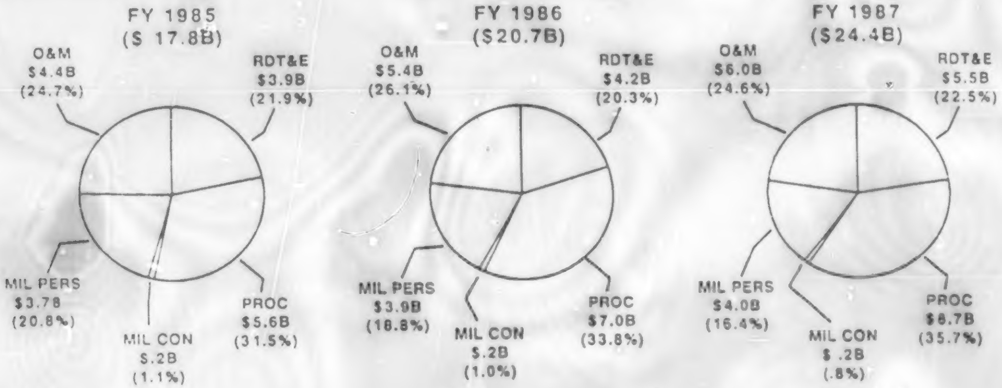
## III. $C^3$ RESOURCE SUMMARY.

The $C^3$ budget request of $24.4 billion for FY 1987 provides the resources necessary to fulfill these goals and reflects our plans and priorities for attaining them. To help us achieve a better overview and integration of the various $C^3$ systems and the forces they support, $C^3$ resources are managed within a mission area structure. Each mission area consists of a group of programs and associated resources mutually dedicated to addressing specific $C^3$ requirements. The following three charts portray the overall resources for $C^3$ aggregated by: (1) appropriation, (2) DoD component, and (3) mission area for FY's 1985, 1986, and 1987. In addition, tables displaying the funding for major $C^3$ programs are appended at the end of this statement.

A fundamental element of the overall strategy for modernizing our strategic $C^3$ systems is the investment of resources needed to carry the programs from the lab, through the production line, and into the field. The FY 1987 budget request is structured to continue the $C^3$ program on this road of progress. However, the future of the program is dependent on the Gramm-Rudman-Hollings Balanced Budget and Emergency Deficit Control Act of 1985

# C$^3$ RESOURCES
# BY APPROPRIATION

(TOA - $ IN BILLIONS)



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## $C^3$ RESOURCES BY DOD COMPONENT

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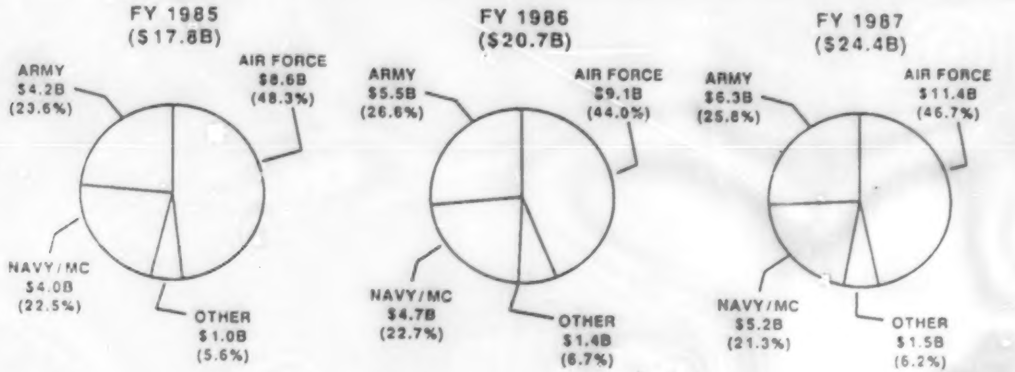

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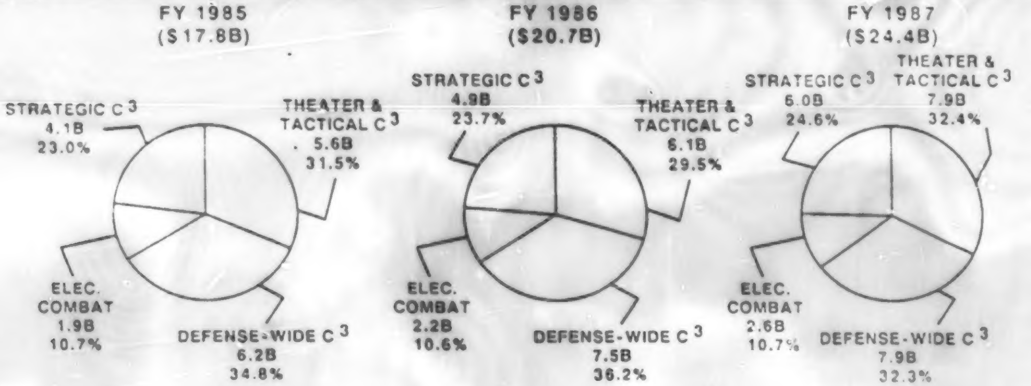
# C$^3$ RESOURCES BY MISSION AREA

## (TOA - $ IN BILLIONS)



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(P.L. 99-177). While it is too early to predict or speculate what Gramm-Rudman-Hollings reductions will finally do to the FY 1987 budget, we must avoid the temptation of allowing domestic fiscal pressures rather than national security requirements to determine the size of the $C^3$ budget.

## IV. $C^3$ MISSION AREA OVERVIEWS.

Strategic, Theater and Tactical, Electronic Combat, and Defense-Wide are the major $C^3$ mission areas. The following mission area overviews highlight their objectives and summarize the status of key programs in each of these areas.

### a. Strategic $C^3$.

This past summer, in a DELETED the President DELETED reaffirmed strategic $C^3$ as the uppermost priority in the Strategic Forces Modernization Program. The results of our R&D efforts, some of which were initiated as a part of the modernization program, are now paying off with $C^3$ hardware and systems being deployed. We are continuing to aggressively pursue development and acquisition activities aimed at resolving those deficiencies which remain in the attack warning/attack assessment (AW/AA), command decision making, and communications connectivity capabilities of our strategic $C^3$ systems.

The programs in the first area, AW/AA, are subdivided into those directed at the ballistic missile threat and those associated with the atmospheric threat.

To support improved ballistic missile surveillance and warning, the PAVE PAWS expansion program is deploying two new phased array radars, one in the Southeast at Robins Air Force Base (AFB), Georgia, and one in the Southwest near Goodfellow AFB, Texas. These new sites will complement the two sites now in operation in the Northeast at Otis AFB, Massachusetts, and the Northwest at Beale AFB, California. Together with the Perimeter Acquisition Radar Attack Characterization System (PARCS) in North Dakota, they will comprise the planned CONUS-based five-site phased array warning network. The two new PAVE PAWS sites will initially be deployed in a configuration DELETED This deployment will close the gaps in warning coverage to the Southeast and Southwest. They will provide a significant improvement in attack warning capability. and will permit closing of the DELETED FSS-7 radar site at MacDill AFB, Florida, and the AN/FPS-85 radar site at Eglin AFB, Florida.

The Ballistic Missile Early Warning System (BMEWS) modernization program will assure continued, reliable warning of intercontinental ballistic missiles (ICBM's) by upgrading the system with new radars and upgraded data processing equipment. Upgrades to the Thule, Greenland, site are continuing, and the site is expected to reach Initial Operational Capability (IOC) in FY 1987. Replacement of the existing obsolete radar system at the Fylingdales, United Kingdom, site with a new phased-array system is scheduled to begin in FY 1986, with a projected IOC of DELETED DELETED These improvements will significantly enhance the quality and detail of missile warning and attack assessment information available for decision making in the event of an attack by ICBM's and submarine launched ballistic missiles (SLBM's).

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In the second area, atmospheric threat surveillance, the existing Distant Early Warning (DEW) Line is being totally replaced. This replacement, called the North Warning System (NWS), will result in a substantially improved capability to detect advanced aircraft and cruise missiles across the entire North American boundary. The new system will include 13 long range radars (LRR's) and 39 unmanned short range radars (SRR's). The LRR's, which are proven equipment (FPS-117 radars) and already deployed in Alaska, will be installed and operating in DELETED The SRR's, which will operate unattended, are now under development and will complete Developmental Test and Evaluation (DT&E) DELETED The LRR's, which are designed for minimal manning, and the unattended SRR's will require substantially less manpower for their operation and, as a result, operational costs will be considerably reduced. Since the NWS will be acquired and operated jointly with Canada, the costs of the system will be shared with Canada. An agreement reflecting this joint endeavor was signed in March 1985. The system is scheduled to attain Full Operational Capability (FOC) in DELETED

The DEW Line upgrade, together with the new Over-the-Horizon Backscatter (OTH-B) radars planned for the east, west, central, and southern U.S., will provide complete contiguous surveillance coverage of all air-breathing threats to North America and assure timely warning of bomber or cruise missile attacks on North America. The OTH-B radars will provide all-altitude coverage for bomber aircraft and air launched cruise missiles to 1800 nautical miles, DELETED The first sector of the OTH-B East Coast system will be completed in FY and integrated with the remaining two sectors in DELETED to form a complete 180-degree coverage East Coast system. With acquisition beginning in the remainder of the West Coast OTH-B system will be procured in DELETED The FY 1987 budget request will support several key functions including DT&E

of the integrated East Coast system and cruise missile detection testing.

In the command decision making area, we are continuing to upgrade the survivability and capability of command assets that would direct U.S. strategic forces during periods of crises through nuclear conflict. A significant improvement in the survivability of these capabilities has been realized with the delivery of four E-4B National Emergency Airborne Command Posts (NEACP) to serve the NCA. During FY 1987, concept development of a $C^3$ suite for a next generation Airborne Command Post will continue and candidate replacement aircraft for the Worldwide Airborne Command Post (WWABNCP) system will be evaluated. Emphasis will continue to be placed on reducing the vulnerability of our airborne command posts to electromagnetic pulse (EMP) effects. The FY 1987 budget request will also complete procurement of the VH-60's, new helicopters to transport the President, and continue other programs to improve the $C^3$ capabilities supporting the President.

A recently initiated program, replacement of the Air Force One Presidential aircraft, will fulfill a much needed requirement for a new Presidential transport aircraft, as well as provide improved communications capabilities. For some time, we have recognized the deficiencies of the current Air Force One aircraft. The increasing information requirements of the President for both personal support and communications have outstripped the ability of the current type aircraft to provide sufficient support. Additional aircraft deficiencies include range, logistics supportability, takeoff and landing limitations, and Federal Aviation Administration imposed engine noise restrictions. Cost estimates have been developed for a replacement aircraft which would satisfy the transportation requirements of the President under any routine or foreseeable emergency situation. We anticipate that competition between qualified American wide-bodied aircraft manufacturers will produce the best product for the lowest price, and we are aggressively pursuing this development and acquisition strategy. In response to a request for proposals from industry, bidders' proposals have been received and are undergoing evaluation.

These and other modernization efforts will help to ensure the survivability and effectiveness of our command facilities and, in turn, support their central role in the operation and control of strategic forces.

Strategic communications programs are structured to provide improved communications and assured connectivity between sensor sites, command locations, and nuclear capable forces. In the ground-based, airborne relay, and satellite communications areas, we are making improvements in our strategic programs with particular attention being focused on increased capacity, survivability, and endurance.

We are continuing to implement the ground-based communications improvements identified in the Strategic Forces Modernization Program. A major effort under the modernization program is the Ground Wave Emergency Network (GWEN), a dispersed network of radio relay stations and user terminals designed to provide assured communications connectivity to CONUS based forces. This system will operate at low frequency and connect major command locations, sensor sites, strategic bomber bases, missile launch control centers, and strategic defense sites. The system will have sufficient relay node proliferation to provide high assurance of EMP-protected austere backbone communications connectivity for missile warning and Emergency Action Message (EAM) dissemination. By the end of FY 1986, development of the prototype 57 relay station Thin Line Connectivity Capability (TLCC) will be completed and, following testing, the system will attain IOC. Prototyping of both missile launch control center and airborne terminals and development of portable terminals will begin DELETE Additional relay nodes and user terminals will be added to achieve a highly proliferated and survivable system, with a FOC planned for FY 1992.

Communications connectivity with our submarine forces is also being improved, and an associated reduction in their susceptibility to detection is being realized with the implementation of the Extremely Low Frequency (ELF) communications system. At the present, a submerged submarine must have an antenna at or near the surface of the water in order to obtain communications. By allowing continuous contact with submarines at much greater depths, the ELF system will permit submarines to maneuver at near optimum depths and speeds, thereby reducing the possibility of detection and minimizing operational limitations. When completed, the system will have two transmitter sites. One is under construction in Michigan, near K. I. Sawyer AFB. The other site, already in existence, is near Clam Lake, Wisconsin. Funding requested for FY 1987 will allow the completion and certification of the Michigan Transmitter Facility, continue the acquisition of ELF receiving terminals for submarines, and support test and evaluation efforts leading to FOC of the system in FY 1988.

The Fleet Ballistic Missile (FBM) submarine force is the most survivable leg of the strategic triad. Deployment of the Trident weapon system has greatly expanded FBM communications coverage requirements which, in turn, directly impact the TACAMO operation. As the replacement for the aging EC-130 TACAMO aircraft, the E-6A, with greater range, speed, and endurance, will address these requirements. We are currently fabricating the prototype E-6A aircraft and will begin ground, laboratory, and contractor flight testing in FY 1987.

In light of the critical role the FBM submarine force fulfills in strengthening our deterrence posture, it is essential that we develop and deploy redundant means to assure survivable and enduring communications to and from the strategic submarine force. Accordingly, the Navy is currently pursuing a technology program with the Defense Advanced Research Projects Agency (DARPA) for the potential development of a satellite-to-submarine blue laser communications system under the Satellite Laser Communications project. This potential future system would address the longer-term needs of employing another communications media for delivering EAM's to the strategic submarine force and support improved tactical submarine communications. The FY 1987 budget request provides for the technology efforts and development of concepts necessary to permit a decision on whether to proceed with such a system by the end of FY 1988. The overriding issues will be cost, system survivability and endurance, and technical performance.

With the as yet unquantified delays in the Space Shuttle launch schedule resulting from the recent Challenger loss, there is a high likelihood for slippage in the launch schedules of some of our satellite communications programs and other space-based systems. Nonetheless, we are continuing to make improvements in the quality and cost effectiveness of these programs.

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For the Defense Satellite Communications System (DSCS) DELETED

DELETED Also, an additional three DSCS-II satellites are serving as on-orbit spares. In order to achieve cost savings, we have a firm fixed price multi-year procurement program for the acquisition of the remaining DELETED satellites.

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b. Theater and Tactical $C^3$.

Theater and tactical $C^3$ systems are essential to military commanders for planning, directing, controlling and operating their forces, including nuclear capable forces. These systems play a vital role in the implementation of national strategy and employment of weapons through the spectrum of potential conflicts.

The overall objective of the theater and tactical $C^3$ program is to provide the secure, reliable and enduring $C^3$ systems needed to enable U.S. and allied forces to be used with maximum effectiveness on the tactical battlefield. Specifically, we seek to provide the forces with secure, jam resistant, and interoperable voice and data communications capabilities; and improved, interoperable identification systems. In pursuit of these goals, we are continuing to implement a number of ongoing programs to improve our near-term $C^3$ capabilities and meet the $C^3$ needs of the future.

A significant step in ensuring interoperable tactical $C^3$ systems was realized when the Joint Tactical Command, Control, and Communications Agency (JTC$^3$A) was formed in 1984 by consolidating existing organizations. Its mission is to ensure the interoperability of tactical $C^3$ systems for joint or combined operations through the development and maintenance of a joint architecture, interface standards, and interface definitions for tactical systems.

The interoperability efforts of the JTC$^3$A have focused on achieving early user capability and immediate assistance to the CINC's. Additionally, it has begun developing the long-term tactical $C^3$ architectures that will become the road maps for evolving $C^3$ systems. Though we cannot expect immediate solutions to all the existing challenges of such complex issues, we are beginning to see increasingly significant contributions to $C^3$ interoperability as a result of the efforts of the JTC$^3$A.

The JTC$^3$A is also responsible for managing the ongoing Joint Interoperability of Tactical Command and Control Systems (JINTACCS) program, established to develop common message standards and procedures for critical command and control ($C^2$) functional areas. For FY 1987, the JINTACCS program will continue development efforts for Tactical Digital Information Links and computer-to-computer communications, including configuration management testing, and support for allied efforts on message text format messages in the tactical functional areas. Funding for the JINTACCS program supports the comprehensive testing and integration of approximately 30 tactical systems to ensure that automated $C^2$ systems achieve and maintain interoperability. This includes a major software configuration management effort.

The program to improve the combat identification capabilities of our forces is also making substantial progress. After years of debate, basic agreement on the design of a new cooperative identification system was reached between the DELETED which cleared the way for a NATO-wide agreement. This system, designated Mark XV in the U.S., will supplement the aging Mark XII system, and will be developed in collaboration with our NATO allies as part of the NATO Identification System. The budget request for FY 1987 will support Developmental Test/Operational Test (DT/OT) I of the system, along with interoperability tests with our allies. Development will also continue on systems to positively identify hostile aircraft through various signature techniques and improve the utilization and transmission of identification data within the overall air defense $C^3$ network.

Air defense capabilities are also being improved with the development of the Forward Area Air Defense (FAAD) $C^2I$ (formerly known as Short Range Air Defense (SHORAD) $C^2$) system. The FAAD system will provide near real-time information to division elements to alert the forces of incoming hostile aircraft, provide target location for using FAAD weapons, and allow rapid exchange of $C^2$ information among FAAD elements. This capability will assist in protecting divisional elements and maximizing FAAD weapons capabilities. We expect to move to a Defense Selected Acquisition Review Council (DSARC) II review and enter engineering development in the near future. Air defense weapons effectiveness will significantly improve as the system begins fielding in the early 1990's.

Initiated at the direction of the Congress, the Integrated Electronic Warfare System (INEWS)/Integrated Communication Navigation Identification Avionics (ICNIA) effort focuses on totally integrating the avionics and electronic combat functions on new aircraft, and possibly on inventory aircraft as well. Total integration means the use of common hardware and software to implement the myriad of functions currently performed by black boxes. In the FY 1986 Defense Authorization Bill, the Congress consolidated the funding for what had previously been separate programs into a single INEWS/ICNIA program. The funding request for FY 1987 will continue this effort as a single, integrated program under the Air Force. The program will explore the benefits of technological advances that will result in size, weight, and power demand reductions in order to attack the problem and resulting expenses of integrating multiple black boxes into various platforms.

Effective data distribution is a key aspect of our theater and tactical $C^3$ architecture. To provide for reliable and survivable data communications, the Joint Tactical Information Distribution System (JTIDS) is being developed to provide a high capacity, secure, jam resistant, digital information exchange system for a wide variety of tactical forces. JTIDS capabilities include data and voice communications, position location/navigation, and cooperative identification among systems users. In the FY 1986 Defense Authorization Bill, Congress directed the DoD, in effect, to consolidate the Air Force and Navy JTIDS development programs. Since that time, the Navy JTIDS development contract has been terminated and a joint program plan, schedule, and funding profiles have been developed for the acquisition of the Air Force terminals by all of the Services. The FY 1987 budget request for JTIDS supports this new plan. We intend to ensure that all JTIDS terminal R&D efforts are consolidated under a single JTIDS joint program office. The work required to integrate JTIDS terminals into the different aircraft, ground facilities and ships will be performed by the individual Services.

Progress in modernizing our theater and tactical $C^3$ systems can not only be measured by these management initiatives and technology efforts, but more importantly by our success in acquiring and fielding new equipment.

We are in production with the Position Location Reporting System (PLRS), a joint program that will provide combat commanders with automatic, near real-time identification and location of their forces on the battlefield. These capabilities are being expanded with the development of the Army Data Distribution System (ADDS). The ADDS, also known as the PLRS/JTIDS Hybrid, integrates the capabilities of these systems and will provide automatic tactical data distribution and an automatic capability for navigation, identification and reporting. The system is secure and jam resistant, and will provide near real-time communications and automatic relay of data messages regardless of weather, terrain or geographic location. Capitalizing on the preceding development efforts of the PLRS and JTIDS will make it possible to satisfy these essential battlefield data distribution requirements much earlier than would otherwise be possible. The budget request for FY 1987 will continue development and allow DT/OT II of the ADDS.

Telecommunications technology continues to advance at a remarkable pace. We recognize the opportunity to capitalize on this technology for our tactical forces. By applying nondevelopment items to military use, we can shorten the cost and acquisition time for many major procurements. An example of this approach is the multibillion dollar Mobile Subscriber Equipment (MSE) program. The MSE is a radio communications system that provides mobile and stationary users the equivalent of automatic secure telephone service for both voice and data. The FY 1987 funding request for the MSE will provide improved communications to our tactical forces in less than one-third of the standard development time, and at a significant cost savings to the government.

Another item which is being fielded is the Single Channel Ground and Airborne Radio System (SINCGARS). This program is aimed at acquiring a new family of manpack, vehicular, and airborne, secure single channel VHF radios. Both the ground and airborne radios are in production. A major acquisition program, the procurement of SINCGARS equipment is continuing with a projected IOC (one division equipped) of early FY 1988. Engineering efforts for FY 1987 will focus on completing the integration of COMSEC circuitry in the aircraft radio and completing the development of ancillary devices.

Our tactical command and control capabilities are also being substantially improved with the fielding of the Maneuver Control System (MCS). The MCS is an automated tactical $C^2$ system which provides a network of computer terminals to process combat information for battle staffs. MCS equipment is currently in production, and fielding of the equipment is expected to continue to 1990 and beyond.

Improved air command and control is the aim of the joint Air Force/Marine Corps Tactical Air Operations Center/Modular Control Equipment (TAOC/MCE) program. TAOC/MCE is a transportable, automated air command and control system capable of controlling and coordinating the employment of a full range of air defense weapons, interceptors, and surface-to-air missiles. The Operations Module, housed in a standard 20-foot shelter, is the basic system element and contains all mission essential equipment with the exception of search radar, identification friend-or-foe (IFF), and prime power equipment. Procurement of the TAOC/MCE began in FY 1986; the FY 1987 request will continue the acquisition.

The presence of U.S. non-strategic nuclear forces (NSNF) in other countries reflects our resolve to deter aggression. Since U.S. doctrine emphasizes deterrence through the maintenance of a sufficient nuclear force, options for the potential use of these forces over a wide spectrum of conflict must be available. Accordingly, our TNF C3 program is aimed at maintaining the levels of survivability and assured connectivity needed to ensure that employment of these options remains viable as the situation dictates.

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The FY 1987 budget request will also continue the acquisition of $C^3$ equipment needed for the basing of ground launched cruise missiles as a part of NATO's long-range TNF modernization program.

Finally, other HF systems are comprised of outdated equipment which provide neither anti-jam protection nor electromagnetic pulse protection, and require increasingly expensive logistics support. In order to alleviate these deficiencies, the HF Anti-Jam program is developing anti-jam (AJ) communications capabilities to meet voice, data, and radio teletype requirements. The program will develop and acquire an HF AJ communications system for the tactical battle group, tactical support, and strategic connectivity needs of surface ships, aircraft, shore communications stations, and submarines. The system will also satisfy additional requirements for DELETED report back, and force reconstitution. The FY 1987 request will continue full scale engineering development of the HF AJ system.

c. Electronic Combat.

Electronic Combat (EC) focuses on the capability to target, disrupt, deceive, and exploit hostile electromagnetic equipment and systems, while protecting friendly forces against such actions. It includes the coordinated use of: (1) self-protection jamming; (2) escort, stand-off, and $C^3$CM; (3) tactical surveillance and electronic support measures; (4) lethal and nonlethal techniques; and (5) tactical deception using electronic means.

The strategy of U.S. forces is to counter the enemy electromagnetic threat by employing a balanced mix of lethal and nonlethal countermeasures combined with tactics. Thus, we are developing and procuring onboard self-protection systems to protect our penetrating aircraft from enemy DELETED stand-off jammers to neutralize warning and acquisition systems, and DELETED

DELETED and anti-radiation missiles to destroy enemy surface-to-air missile systems.

The major EC efforts under way today are directed toward employing integrated EC systems to keep pace with a rapidly changing and expanding enemy threat and continuing the emphasis on joint Service programs to maximize return on investment and reduce unnecessary duplication. Supporting this approach, the recently published first edition of the DoD Electronic Warfare Plan is an important first step toward achieving an improved, integrated EC acquisition and investment strategy that provides the framework for future development. Unfortunately, there are too many EC programs in some form of difficulty. We must do a better job in managing these programs at the Service level and in oversighting them in OSD.

In the area of self-protection jamming, we are making improvements in the performance and quality of on-board systems for tactical aircraft. A major new system under development to significantly increase self-protection capabilities is the Advanced Self-Protection Jammer (ASPJ). The AN/ALQ-165 ASPJ is a joint Navy and Air Force program to provide an effective defensive electronic countermeasures system for the self-protection of both Navy and Air Force tactical aircraft. The ASPJ has completed a major portion of Phase II Full Scale Development, and prototype ASPJ systems are now being produced and fielded for testing. However, the program has experienced a DELETED delay. DELETED

We are watching the program very closely and will be conducting monthly reviews with the program office. As a result of this initiative, we will be giving the program additional oversight attention. Additionally, we have initiated the source selection for a self-protection electronic countermeasures system for F-111 aircraft. For these electronic countermeasures programs, we are also initiating efforts to incorporate robust monopulse techniques into these systems under preplanned product improvement programs. These techniques were developed under the HAVE EXIT program and are undergoing extensive flight testing.

In addition to the internal countermeasures systems, there are DELETED aircraft which require electronic countermeasures pods. These aircraft do not have the space, wiring, or cooling for an internal system. As a result, we are procuring ALQ-131 Block II pods and modifying the ALQ-119 pods which were built in the 1971-1976 time period. In addition to these efforts, we have structured a competitive program, called SEEK RAM, to provide a pod with DELETED and high reliability. The specifics of the overall DoD EC pod strategy are in review to ensure that we are on an optimum path. I expect changes in the overall strategy as a result of this review.

Similarly, concentrated efforts are under way to provide new and improved radar warning receivers to enable our tactical aircraft to handle the complex threat radar signal environments that will be encountered in future conflicts. Last year, we planned to initiate production of the

ALR-74 for the F-16C's. However, the ALR-74 prototype experienced DELETED DELETED , which required a thorough evaluation of alternative radar warning receiver systems. The ALR-56C, planned for the F-15C/D/E's, appeared to be a viable candidate. As a result, we have structured a competitive program of the ALR-74 versus ALR-56M. The competitive program is currently in Phase I with a June 1986 review. For the F-111 requirements, we are proceeding with an upgrade to the currently installed ALR-62. (In 1985, we examined the ALR-74 for the F-111s instead of the ALR-62, under Congressional direction, but the ALR-74 would not meet the DELETED requirement.)

For the Navy's surface ships, the primary thrust is to provide self-protection for combatant ships and aircraft carriers. There are currently more than [illegible] operational AN/SLQ-32 and AN/SLQ-17 self-protection systems on Navy ships today, with a planned deployment of approximately DELETED additional systems per year through FY 1991. Our FY 1987 efforts will continue to address electronic decoys, DELETED [illegible] and additional systems improvements needed for reliable and effective self-protection.

In addition to the self-protection programs, we have an extensive program for upgrades to the EF-111's, EC-130's, and EA-6B's. These systems provide the capability to degrade the enemy's C3 systems.

The Army's major EC and C3CM programs are the TACJAM DELETED [illegible] jammer, QUICK FIX heliborne system, AN/TLQ-17A ground based system, and various expendable jammers (EXJAM). A major initiative planned for FY 1987 is the acquisition of TACJAM equipment. A jamming system installed on tracked vehicles, the TACJAM is highly mobile on the battlefield. Accordingly, acquisition of the system will substantially improve the EC capabilities available for use in forward areas. The EXJAM program will continue the investigation and development of a family of inexpensive communications jamming devices such as a communications electronic countermeasures unmanned airborne vehicle jammer and artillery delivered expendable jammer.

The Air Defense Electronic Warfare System (ADEWS) is being developed to overcome the Army's threat of low flying aircraft in the forward battle area. The ADEWS is being designed to uniquely identify "friend or foe", interface with the FAAD $C^2I$ network for coordinated air defense, and jam aircraft navigation and radar receivers. The ADEWS program will also include the DELETED DELETED There is a joint review under way to determine if there is a better strategy using components of an Army special access program to greatly assist in this ADEWS mission.

Many new efforts of lesser magnitude are being vigorously pursued to counter enemy command and control systems, to DELETED

DELETED

The Services are concentrating on a better balance of programs aimed at developing and fielding new technologies to support a broader mix of EC assets to penetrate enemy defenses. More emphasis is being placed on DELETED to confuse and destroy hostile weapons guidance systems. A concentrated effort has been mounted in all Services to neutralize the enemy use of DELETED guided weapons by developing sensors to detect

DELETED

d. Defense-Wide C3 Programs.

The remainder of our $C^3$ programs fall into the category called Defense-Wide $C^3$. These programs provide $C^3$ systems for long-haul communications, headquarters and base support requirements, defense-wide communications between national and theater $C^2$ elements, information processing and display for strategic $C^2$, and communications and computer security.

The Defense Communications System (DCS) provides global long-haul telecommunications service to DoD. To improve the capabilities of the DCS, we are continuing to pursue major improvements to the Defense Switched Network (DSN) and Defense Data Network (DDN).

The DSN is DoD's next generation, long-distance telephone service. Phase I of the DSN will be operational by FY 1987 and will provide telephone, data, and video services in portions of the Western Hemisphere. We are continuing to acquire, install and test digital transmission equipment worldwide. By exploiting the Public Switched Network and procuring commercially available technology, the FY 1987 program will continue to progress toward its goal of replacing the Automatic Voice Network (AUTOVON).

The DDN is the common-user, long-haul digital communications system which supports all DoD data transmission requirements worldwide. The DDN is being expanded to accommodate new subscribers. The classified and unclassified networks in the DDN program have been enhanced and expanded for reliability, survivability and maximum availability. The classified networks will be merged for even greater survivability and interoperability using end-to-end multilevel security protection. Also, the aging Automatic Digital Network (AUTODIN) switching centers and DoD Automated Message Processing Exchanges will be replaced by the Inter-Service/Agency Automated Message Processing Exchange (I-S/A AMPE). With initial fielding being projected for 1988, I-S/A AMPE will provide multilevel secure message processing with significantly enhanced performance using the DDN for the transmission backbone.

The Worldwide Military Command and Control System (WWMCCS) Information System (WIS) is DoD's modernization program for WWMCCS Automated Data Processing (ADP) hardware and software. The WIS is being developed and fielded in "blocks" of capabilities. Block A, which provides the technical foundation for the entire WIS program, is scheduled for Operational Test and Evaluation (OT&E) in FY 1988. The FY 1987 procurement request will acquire Local Area Network and Automated Message Handling capabilities for the

Service sites that are needed for transition to the WIS.

Other ADP modernization efforts include upgrades to ADP equipment at the NORAD-Cheyenne Mountain Complex needed to satisfy C3I requirements for space operations and replacement of the Command Center Processing Display System. Competitive design contracts for the Command Center Processing Display System-Replacement (CCPDS-R) were awarded in FY 1985. When completed, the CCPDS-R will provide improved display of warning information for the nation into the year 2000.

We are continuing to improve and expand the application of security equipment and techniques for computer and communications systems. To support the continued growth of ADP operations in government, Computer Security (COMPUSEC) efforts are focused on ensuring proper access to and protection of sensitive data bases. A major Communications Security (COMSEC) initiative for FY 1987 is the development and acquisition of low cost and secure telephones, known as STU-III's, for use throughout the Federal Government. The fundamental objective of the STU-III program is to achieve a widespread secure telephone capability with universal interoperability among all users. In order to attain this objective, we are transitioning from the STU-II to STU-III as the U.S. common-user telephone security instrument at the earliest possible time. As soon as parallelism between the STU-II and STU-III is achieved, the STU-II will be removed from U.S. regular service. Other COMSEC improvement efforts of particular note include initiatives to eliminate hard copy and paper based systems in the nuclear $C^2$ arena and initiatives to increase the embedding of COMSEC in host systems, with the added benefits of space and cost savings.

The major program for worldwide navigation and position fixing, the Navstar/Global Positioning System (GPS), will provide a significant improvement in our capabilities for navigation, weapon deliveries, force control, precision surveys and many other applications. It is a space-based system with worldwide coverage which provides accurate three-dimensional position, velocity, and time information. The GPS satellites also carry sensors to detect nuclear detonations as part of the Nuclear Detonation (NUDET) Detection System (NDS). Satellite production is continuing, and the launch of the first operational satellite was scheduled for 1986. The shuttle loss will delay this launch by perhaps 6 to 12 months at a minimum. Deployment of an 18 satellite constellation is still scheduled for 1988, but is dependent on the impact of the shuttle loss. Full deployment of operational user equipment is planned for completion by the late 1990's. Deployment of the GPS will provide much needed capabilities that are unavailable under any existing single system or combination of systems.

## V. CONCLUSION.

In conclusion, I want to stress that comprehensive and integrated $C^3$ systems are the cornerstones of force readiness and sustainability. As such, they are an essential factor in maintaining a credible deterrence posture. The highlights I have presented illustrate the progress that is being made in reducing the weaknesses in our C$^3$ systems and, in turn, enhancing the readiness of our forces.

Goals have been established, plans and programs have been developed, and an initial investment has been made to eliminate serious deficiencies in our C$^3$ capabilities. As a result of this commitment, our C$^3$ systems are being modernized with significant and vitally important capabilities. Critical components necessary for the success of the modernization effort are the continued acquisition and deployment of new equipment to improve our current C$^3$ capabilities, and the vigorous R&D needed to field the C$^3$ systems of the future. Appropriation of the FY 1987 budget request for C$^3$ programs will sustain these efforts and send the message that the Congress is committed to completing the rebuilding of the C$^3$ systems required for a strong national defense. Your support of our budget request is urged so that we can not only achieve an integrated and reliable C$^3$ system to complement the broader forces modernization efforts, but also to strengthen our deterrence posture today and into the next century. By building the strongest possible deterrent, we are able to protect our interests, while maintaining peace. However, a strong deterrence posture is impossible to maintain without the requisite C$^3$ capabilities.

Mr. Chairman, this concludes my statement. Thank you.

## MAJOR C3 RDT&E PROGRAMS

| | ($ in Millions)<br>FY 1987 | <br>FY 1988-91 |
|---|---|---|
| **Strategic $C^3$** | | |
| DELETED | | DELETED |
| E-6A | 81.7 | |
| DSCS | 14.0 | |
| **Theater & Tactical $C^3$** | | |
| JTIDS | 221.7 | DELETED |
| AWACS | 137.2 | |
| JINTACCS | 81.6 | |
| $JTC^3A$ | 77.7 | |
| CIS | 47.0 | |
| HF/AJ | 34.5 | |
| SHORAD $C^2$/FAAD | 82.1 | |
| E-2C | 34.5 | |
| **Electronic Combat** | | |
| ASPJ | 30.0 | |
| COMPASS Call | 25.1 | |
| EA-6B | 69.7 | |
| Army ASE Program | 25.1 | |
| SLQ-17/32 | 17.4 | |
| **Defense-Wide $C^3$** | | |
| | | DELETED |
| Granite Sentry | 20.4 | |
| I-S/A AMPE | 54.6 | |
| WIS | 170.9 | |
| CCPDS-R | 27.4 | |
| Long-Haul Comm (DCS) | 47.4 | |
| Navstar GPS | 202.0 | |
| NCMC | 74.2 | |

## MAJOR $C^3$ PROCUREMENT PROGRAMS

| | ($ in Millions)<br>FY 1987 | FY 1988-91 |
|---|---|---|
| **Strategic $C^3$** | | |
| E-6A | 329.4 | DELETED |
| DELETED | DELETED | |
| OTH-B | 200.1 | |
| DSCS | 122.6 | |
| NDS | 24.9 | |
| GWEN | 123.4 | |
| Milstar | 56.4 | |
| FLTSAT Follow-on | 65.1 | |
| DELETED | DELETED | |
| DEW Line Radars | 4.3 | |
| **Theater & Tactical $C^3$** | | |
| MSE | 903.7 | |
| TAOC | 51.2 | |
| MCE | 73.1 | |
| JTIDS | 49.0 | |
| SINCGARS | 249.4 | |
| E-2C | 483.8 | |
| HAVE QUICK | 55.2 | |
| AWACS | 89.1 | |
| **Electronic Combat** | | |
| EA-6B | 439.7 | |
| QUICK FIX | 171.2 | |
| SLQ-17/32 | 133.2 | |
| ASPJ | 501.9 | |
| TACJAM | 33.0 | |
| **Defense Wide $C^3$** | | |
| COMSEC | 562.3 | |
| (STU III) | (116.7) | |
| NCMC | 52.0 | |
| WIS | 90.4 | |
| Long-Haul Comm (DCS) | 217.1 | |
| Navstar GPS | 318.0 | |

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Mr. DICKS. The gentleman from Florida.

### OVER-THE-HORIZON BACKSCATTER RADAR

Mr. YOUNG. Thank you, Mr. Chairman.

Because the over-the-horizon backscatter radar comes at the target from a different direction than a ground-base radar, ———?

Mr. LATHAM. ———.

Mr. YOUNG. You said the Soviets have had the over-the-horizon system for a long time. Are we paying attention to that as we develop our stealth bomber?

Mr. LATHAM. Absolutely. We can do certain things with ———. So one of the ways ——— that they won't be able to detect you.

Mr. YOUNG. Thank you, Mr, Chairman.

Mr. LATHAM. The OTH program is summarized in terms of numbers, about $200 million in 1987. It is a billion dollar program over the 1988 to 1991 time frame. This will continue beyond 1991.

[CLERK'S NOTE.—Classified slide removed.]

The IOC's and the various dates are shown here. The ——— system will be on contract in July.

### MSE PROGRAM

Another very major initiative is the MSE Program. This is an Army program. It is designed to completely modernize the Army's corps and division communication systems, including the reserves and the guard.

[Slide follows:]

# MSE PROGRAM OBJECTIVES

- PROVIDE CORPS AND DIVISION WITH AUTOMATIC, SURVIVABLE, SECURE, SWITCHED VOICE AND DATA COMMUNICATIONS
- IMPROVE MOBILITY, FLEXIBILITY, TRANSPORTABILITY, AND RESPONSIVENESS OF EXISTING TACTICAL SWITCHED COMMUNICATIONS
- REDUCE COST AND MANPOWER
- SUPPORT AIR/LAND BATTLE DOCTRINE
- INTEROPERABLE WITH EXISTING SYSTEMS OF ALLIED AND U.S. ACTIVE AND RESERVE FORCES
- ACQUIRE ON A NON-DEVELOPMENTAL BASIS - NO RDT&E
- FIELD TO NATIONAL GUARD AND RESERVE UNITS COINCIDENT WITH ASSOCIATED ACTIVE UNITS

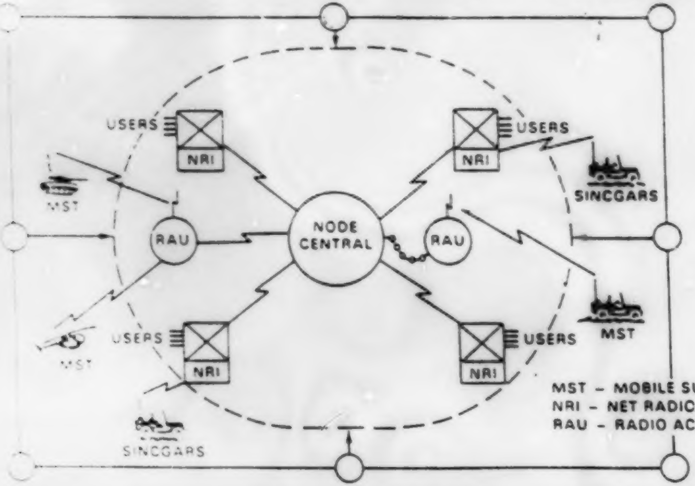
**Mr. Latham.** The plan is to field this system in about five years, to provide very mobile flexible transportable hardware. It is really a "cellular" phone system for the Army in the sense that it will be a highly mobile battlefield telephone system. It can be used with all types of forces such that you can have high mobility and security and full interoperability. We want to modernize, including the Guard Reserves in about five to six years.

[Slide follows:]

# MOBILE SUBSCRIBER EQUIPMENT

SECURE MOBILE TELEPHONE
SERVICE IN JEEPS, TRUCKS,
TANKS (M-1), HELICOPTERS
FOR KEY COMMANDERS

TYPICAL MSE NODE DEPLOYMENT


USERS
NRI
USERS
NRI
SINCGARS
MST
RAU
NODE CENTRAL
RAU
MST
USERS
NRI
USERS
NRI
MST
SINCGARS

MST – MOBILE SUBSCRIBER TERMINAL
NRI – NET RADIO INTERFACE
RAU – RADIO ACCESS UNIT

SERVICE: U.S. ARMY

**Mr. Latham.** The concept is shown here. There will be these various components in it. You will be able to get into the system by net radio interface devices such as a person with SINCGARS or VHF combat NET radio can get into the system.

There will be small nodes compared to what the Army used before in their concepts for this. This will allow full interoperability across all the parts of the Army as well as interoperability through gateways into NATO.

The current procurement of this is a U.S.-French team and about 25 to 30 percent of the system will be foreign-built.

**Mr. Young.** How large a unit will that system serve?

**Mr. Latham.** The way these will be set up, there will be—I will have to take that for the record. I don't remember, but the nodes are downsized from what the original concept was in the TRITAC program and in a corps you will have a large number of nodes.

I don't remember the exact number, but I will get you a number on that.

[The information follows:]

The Army is buying MSE in corps and division signal battalion sets. The number of nodes the signal battalion provides per corps is forty-four.

**Mr. Latham.** That is a good question because this gives you a much higher survivability.

The milestones are shown here.

[Slide follows:]

# MSE MILESTONES

| | |
|---|---|
| RFP RELEASE | 2 JULY 84 |
| PROPOSALS RECEIVED | 1 OCT 84 |
| CONTRACTOR DEMONSTRATIONS | DEC 84 AND MAR 85 |
| SOURCE SELECTION COMPLETED | NOV 85 |
| REPORT TO CONGRESS | NOV 85 |
| CONTRACT AWARD | DEC 85 |
| FIRST UNIT EQUIPPED | EARLY 1988 |
| USER EVALUATION | MID 1988 |

This is sort of a miracle that got pulled off by the Army that we actually got the RFP out, got the proposals in on time, did the evaluations, had two major contractor demonstrations, did a source selection, sent a report to Congress, Congress concurred and we awarded the contract and the first units will be started to be equipped in three years.

No R&D. Everything was off the shelf. We made the two contractor teams demonstrate very large amounts of equipment twice in order to see that this would work. Both the French-American team and the British-American team did have successful large demonstrations, and by then we were highly confident that we had hardware that was mature, that testing data was available and so on.

There is going to be a user evaluation in mid-1988. The contractor does not get paid until he passes this demonstration and test at Fort Hood.

Mr. MURTHA. What was the difference between the price of the British and, the French?

Mr. LATHAM. It was ——— dollars. It was amazing the difference in price. In fact, the British team had for some reason—and there is a detailed story on that—came in with a very substantial higher bid for a number of items in the program and it ended up being several billion dollars difference.

Mr. MURTHA. And Mrs. Thatcher's complaint that they didn't understand what they were bidding on just wasn't accurate?

Mr. LATHAM. I don't believe that is accurate at all. They just did a poor job in the way they did their adding up. For example, they had items in there like trucks—this is a turnkey operation, they buy everything and we get the system. They had HMMWV's there at three times the price we can buy them and I don't know why they did that.

Mr. MURTHA. So with that kind of discrepancy in the price, there was something wrong with their bidding?

Mr. LATHAM. They didn't do a thorough job with their cost proposal and that was thoroughly explained to the U.K. They seem satisfied that there was no unfair thing: It was simply a difference in price.

Both systems met the spec. The British system was a very good system. They had a very good logistics plan. The British were going to build a factory to produce it in the States, and that was a fairly large number that they had included in the bid price. It was a very good competition, but they just didn't sharpen their penci

[Slide follows:]

# MSE PROCUREMENT FUNDING BY FY
## ($ in Millions)

---

| FY | AMOUNT | QTY (SETS) |
|---|---|---|
| 85 | 63.3 | .6 |
| 86 | 335.3 | 3.4 |
| 87 | 903.7 | 8.0 |
| 88 | 1,019.8 | 11.0 |
| 89 | 995.7 | 10.0 |
| 90 | 976.2 | 13.0 |
| 91 | 840.0 | * |
| TOTAL | 5,134 | 46.0 |

*MSE NECESSARY TO OUTFIT 3 NEW ARMY DIVISIONS AND 3 SEPARATE BRIGADE SHOULD THESE ADDITIONAL UNITS BE APPROVED.

300-L69227 1

Mr. **Latham**. We are asking for $900 million in 1987 up from $335 million proposed in 1986. It goes up to almost a billion dollars in 1988 and runs out at these numbers, so the cost of the system, including spares, is over $5 billion.

The dollars to equip the active Army, the Guard and the Reserves—was advertised at $4.3 billion and that is still the number that we are talking about for this program, the $840 million in FY 91 is for 2 additional Army divisions and 3 brigades should these new units be approved.

So it is still $4.3 billion. That was brougnt up in the House Armed Services Subcommittee on Procurement and the number is still $4.3 billion and there has not been cost growth. This is a program yoiu have to watch though because we said no changes, and we are saying we are buying it as is. There are guys who would like to come out of the woodwork and start tweaking things, and we are saying no.

So it is a fixed-price, go-get-it program.

In 1988, we will have bought enough hardware to do a user test and then the contractor starts getting paid, provided the system satisfactorily passes the user test.

### EFFECT OF SHUTTLE DISASTER

You asked about the shuttle. Let me show you our analysis of this. ———. A question would be greater utilization of expendable launch vehicles, why can't DOD launch move satellites off expendables.

We are doing that, but every existing expendable launch vehicle is already spoken for with payloads and here the payloads noted. Some of these Air Force-classified payloads.

Lat year we were able to successfully get Congress to fund the Complementary Expendable Launch Vehicle (CELV) program for 10 vehicles. These are classified as "shuttle bay equivalents". A shuttle bay equivalent CELV will life the weight and volume of a shuttle bay into orbit. We have all of those spoken for down the line.

The bottom line is we don't have any flexibility and no spare vehicles lying around. We will have to buy more of these in order to begin to compensate for the loss of the shuttle.

If you look at what would happen if the shuttle is only down for 12 months, and we have done it for 6, 12, 18, and 24 months—so if it is down for 12, these are the payloads that were to have been flown on that vehicle.

What we have done is theoretically put on the remaining three shuttles a series of DOD and NASA payloads to see what we could launch at the Kennedy Launch Center.

In a time frame starting in January of 1987, these are the launches that would take place. At Vandenburg, a similar story. We would have ——— launches from Vandenburg in 1987, ———.

Here are the various payloads and if you have no loss of the shuttle, those are the white dots. Six months in green. The yellow dots are 12 month delays. The red diamonds are 18 month delays. I didn't put 24 months on this viewgraph.

You can see what happens as you lose the shuttle ———.

So if the first launch of the shutttle again is now looking like the ——— that is the impact on the DOD payloads.

Mr. Young. Why did you extend your estimate to 18 months?

Mr. Latham. We have done it for 24 as well. We believe that even with the one approach that NASA has come up with, which is a so-called quick fix to the joint which is to bolt it together, actually drill holes around the joints, put heaters on them and pull them in, that that is going to have to be tested.

That is still going to take somewhere between ———. If they have to go back and redesign the joint and get it requalified and do this for both the steel cases and the filament wound cases, than you are talking more like ——— months or longer.

NASA will issue a date that they expect to launch next time, some time in May. There is a meeting on Friday at the White House of the Senior Interagency Group on Space that is going to discuss this and the report that we have generated with NASA and the other agencies on the techncial aspects and the impact on DOD payloads.

Now, we think it will be as much as ——— standdown and that has a drastic effect on our access to space.

To recover, it turns out if it is 12 months, there are about 15 shuttle bay equivalents that you are behind. Here are the civilian payloads in orange and the DOD payloads in greenish-blue.

This is fiscal year 1989, 1990, 1991. Assume you buy some additional ELV's. You buy two additional CELV's per year and four Titans, and you can vary the numbers; you buy back the Green area noted here and you buy this much more and this much more in those fiscal years.

Now you buy a fourth orbiter and try to get it on line in fiscal year 1990 and you can start to buy back a little bit of those payloads.

There are a lot of things scheduled to go into space that are not going to get into space unless somebody does a couple of things. One, buy an orbiter and two buy a lot more expendable launch vehicles for the civilian, NASA and DOD world.

The proposal in our supplemental that we have sent to OMB is that we actually go to not four CELV's a year, but to five or six and to six or seven Titans or Titan-equivalents at least launches a year, probably a dozen ELV launches a year, plus buy a forth orbiter and in the early nineties you start to recover, but it is a long time.

For the civilian market, it says you better move to CELV's or ELV's in a hurry or you are never going to get into space.

Mr. Murtha. I there a question that DOD has priority?

Mr. Latham. Yes. There is an agreement that we can preempt for national security payloads and that set of launches assume that we did preempt as many as we could, but there are certain NASA payloads that can only on the shuttle, like Galileo and the space telescope, and they have to get up.

Almost everything else can be moved to CELV's or ELV's. That takes money because you have to redesign or requalify satellites to launch them on CELV's or ELV's if they were initially designed/qualified for the shuttle-only launch. The production Global Positioning system (GPS) satellites were designed for shuttle launch. It takes perhaps two years to requalify them for launch an on ELV.

So we will see a slip in many programs until we start recovering either by ELV's or shuttles.

Mr. **Miller**. You speak of the DOD payload for the shuttle, but we have not had that much information about what those payloads consist of and why delays would be that serious.

Mr. **Latham**. Yes, sir. Well, we would be glad to go into a higher classification meeting with you and show you specifically what those are. In fact, if you go back to that one vugraph that had the 6, 12, 18-month slip, it lists the various payloads. These are the DOD payloads all listed here. The ones that have ———.

So it is a very serious problem.

What we have said in conclusion on the analysis for the near term, no big issue, but it is not near term anymore, mid-term is 12 months; far term is what we are looking at, using a mixed fleet concept.

We have to do something about the second generation shuttle to bring that on line in the year 2000 so that we have these solutions emerging together so we can have assured access to space.

Right now we are———.

### EFFECT OF GRAMM-RUDMAN ON C3I

The question would be what happened in 1986 on Gramm-Rudman.

[Slide follows:]

# $C^3$I PROGRAMS EXEMPT FROM FY 86 GRAMM-RUDMAN REDUCTIONS

- E-6A RDT&E
- EA-6B RDT&E
- MSE
- VH-60
- CIRCUIT MAYFLOWER
- NAVSTAR GPS (MULTI-YEAR)
- DSCS (MULTI-YEAR)
- NDS (MULTI-YEAR)

234-DC7888.4

**Mr. Latham.** In 1986 we had the flexibility in the law to allow us to exempt certain programs from any cuts and to absorb the total by hitting some programs twice as hard.

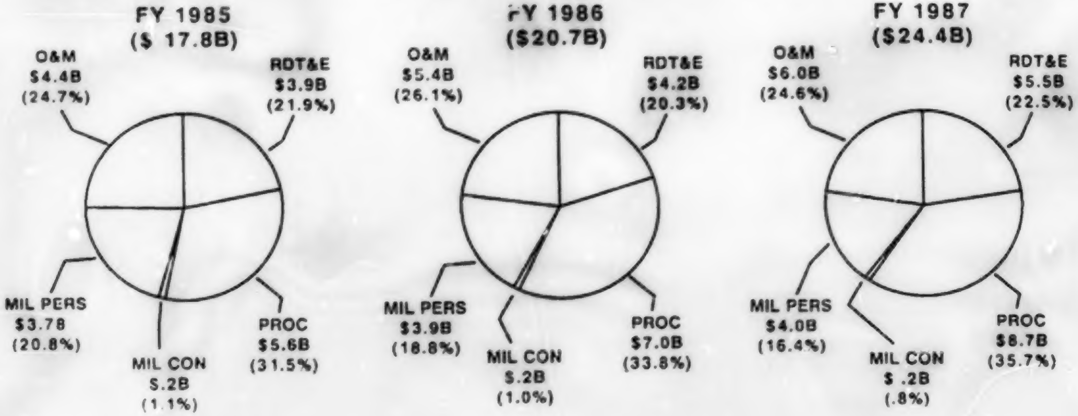
We decided in the C3I area that these programs would be exempt from Gramm-Rudman as shown here.

Some of these were multi-year contracts.

[Slide follows:]

# C$^3$ RESOURCES BY APPROPRIATION

(TOA - $ IN BILLIONS)



MARCH 1986

184-E67755 11

Mr. **Latham**. In 1986, everybody was kind enough to appropriate and authorize, although there is some controversies there still, we at least received $20.7B. This year we are asking for $24.4B, an 18 percent increase.

What we have done in the 1987 time frame in aggregating the dollars in the C3 area, is that additional program elements have been added under my responsibility that were not here in these prior years, so this is somewhat apples and oranges between FY-86 and FY-87 total dollars.

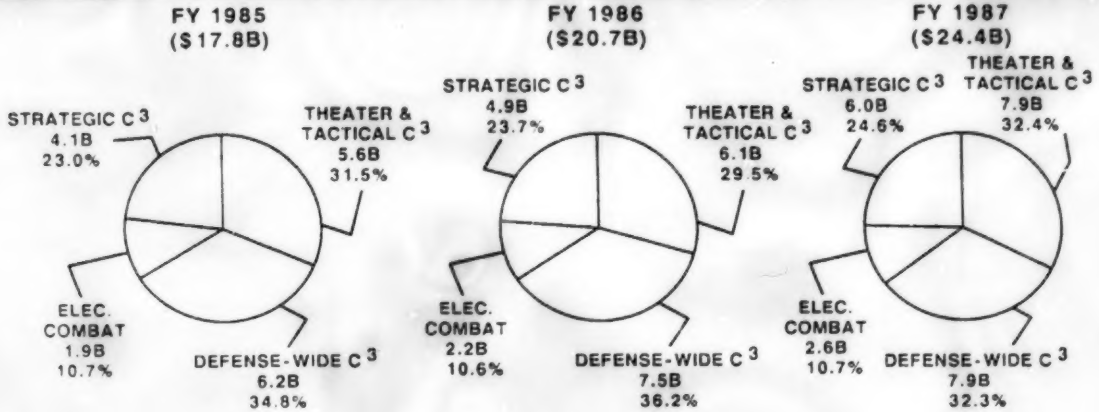
If you take those out of this number here, this comes down to more like $22B so that there is a little bit of skulduggery and it is because we have added certain programs which we didn't have under our responsibility before.

Procurement is up to $8.7 billion. It was only $7 billion in 1986. We are about 10 percent of the total DOD procurement account now if you exclude ships.

[Slide follows:]

# $C^3$ RESOURCES BY MISSION AREA

### (TOA - $ IN BILLIONS)



FY 1985 ($17.8B)

FY 1986 ($20.7B)

FY 1987 ($24.4B)

MARCH 1986

234-A67754.8

**Mr. Latham.** Then in terms of the various areas, strategic theater, tactical and so on, strategic is $6 billion and about 25 percent and was $5 billion in FY-86. It is up substantially.

In the strategic area are the MILSTAR, all the COMSATS, all the warning systems, and those supporting the tactical area, we aggregate them in strategic.

The theater tactical area is 32 percent of the total $C^3$ budget.

Some have said you are unbalancing the program. That is not true. It is very well balanced, I think, across the programs.

You can see these percentages and dollar changes here as they have gone through three fiscal years. There has been very substantial growth in the C3 account.

Let me summarize here——

### ELECTRONIC COMBAT

**Mr. Dicks.** Put the chart back up.

What is electronic combat?

**Mr. Latham.** Electronic combat is the terminology for what people in the past called electronic warfare and C3 countermeasures. This buys, for example, EA-6B jammer, aircraft. It buys the Advanced Self Protection Jammer (ASPJ) program, all the electronic combat things that go on fighters, ships, and strategic bombers.

**Mr. Dicks.** This may not be in your shop, but you are talking about countermeasures. One thing we heard at Sandia is the possibility of using ———. Who is responsible for that? Is that DNA?

**Mr. Latham.** Yes, DNA.

I would be very cautious about that story because we ———.

[Slide follows:]

# SOME OBSERVATIONS

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○ PRIOR R&D "PAYING OFF" IN PROCUREMENT OF $C^3$ SYSTEMS

★ MILSTAR ★MRT ★DSP ★SINCGARS ★ELF

○ MAJOR CAPABILITIES COMING ON-LINE

★ DSCS III ★GPS ★GWEN ★COMSEC

○ INCREASED PROCUREMENT ACCOUNT GROWTH IN THIS DECADE

○ EVOLUTIONARY ACQUISITION - "A WAY OF LIFE"

○ EXPECT MORE NDI ACQUISITIONS

-- ALA MSE --

Mr. Latham. I think we can say that the prior R&D is paying off. In procurement you are seeing that move out. There are major capabilities coming on line. There are major increases in the communications security area, and a lot of growth in procurement.

You will see that growth continue up until about 1991. I see it bending over in about the 1991 time frame. Evolutionary acquisition is the way we are doing things and a lot more NDI is going to be there

Let me try to answer the Libya question. We used ———. That is being assessed now.

Mr. Murtha. As far as we know, that plane that is missing was not shot down?

Mr. Latham. No, we don't know that. There was ———.

We have heard nothing from him as of this morning. I had DIA in this morning, so it is a lost aircraft.

Mr. Murtha. You don't know how effective the countermeasures were at this point. You know there were surprises and that they used radar and we used countermeasures, but we know we lost one plane?

Mr. Latham. For example, we know from ———.

Mr. Murtha. Do we know how many missiles they fired?

Mr. Latham. No, not as of this time.

Mr. Dicks. The fact that we were able through ———, how vulnerable are we to those kinds of signals?

Mr. Latham. I would characterize that——

Mr. Dicks. How vulnerable are we to that kind of signals intelligence?

Mr. Latham. We are ———.

The vulnerability is to subtle attacks like the Gunman where they bugged the typewriters. That is what worries you ——— internal sources intercepts of information via sophisticated electronic "bugging." Are you familiar with the Gunman story?

Mr. Dicks. No.

Mr. Latham. The Soviets in this sixties were successful ———.

We have changed all that out now, but is was a very sophisticated, well-done job.

So that is the ultimate compromise.

### C3 AND GRAMM-RUDMAN-HOLLINGS

Mr. Dicks. We are going into procurement now—you talked about the request for C3 and its increase and it is up to now $24.4 billion. This 18 percent increase in 1986 and a 37 percent increase from 1985.

You mentioned some of the reasons for the rapid growth rate, but what about the fact that we are now looking at Gramm-Rudman-Hollings? Do you think that kind of budget you are forecasting this year is realistic in light of the possible Gramm-Rudman-Hollings impact?

Mr. Latham. I will give you the standard answer and then we can talk about it.

If the Gramm-Rudman trigger doesn't happen, I think we are okay and the budget that we submitted would not cause the trigger. If we in fact are subjected to the Gramm-Rudman-Hollings triggering mechanism in 1987, then we are going to see approximately 20 percent come out of the budget, and that wipes that 18 percent out plus some, and we are in very difficult trouble.

Mr. Dicks. What would your strategy be if that happened?

Mr. Latham. I don't have a strategy——

Mr. Dicks. You do a line-item-by-line-item approach.

Mr. Latham. Yes. Our hands are tied.

Mr. Dicks. What if Congress wanted to develop an alternative budget and came to you and said, "We have to cut 10 percent out of your area. We have to do it in order to get down to the level," what would your strategy be then? What if we gave you the leeway?

Mr. Latham. If you gave me the leeway like you did in 1986, I will reprioritize to take the 10 percent off the things that will hurt the least and keep the things going that I feel are highest priority.

If you ask me in the strategic area what is my highest priority, it would be MILSTAR. If Gramm-Rudman triggers on the current law, you will get 20 percent out of the program. We will never see a ——— launch. That is a very serious problem.

Mr. Dicks. That would be the number one item you would like to see protected?

Mr. Latham. On the strategic side, absolutely.

Mr. Dicks. Do you have firm fixed contracts that would be overturned by Gramm-Rudman-Hollings?

Mr. Latham. Yes.

Mr. Dicks. Why don't you put in the record the firm fixed-price contracts that you would be worried about breaching and especially a description under your multi-year contracts

Mr. Latham. Yes, sir.

[The information follows:]

Of particular concern is the ability of the following major multiyear contracts to absorb Gramm-Rudman-Hollings (GRH) reductions while avoiding contractual terminations.

(1) Global Positioning System (GPS) Satellites and Nuclear Detonation (NUDET) Detection System (NDS) Multiyear Procurements: The Navstar GPS fills a critical requirement for a worldwide, three-dimensional positioning and navigation capability. In addition, the satellites also host NDS sensors. A multiyear contract for a block buy of 28 Navstar GPS satellites with NDS capability was awarded to Rockwell International in September 1982 and is planned for completion in FY 1988.

(2) Defense Support Program (DSP) Multiyear Procurement: DSP satellites ——— data to the National Command Authority and other designated users. Contracts for launch vehicle integration, support, and previous blocks of satellites have been awarded to TRW and Aerojet Electro Systems; a multiyear satellite procurement of the next block of satellites is planned.

(3) Defense Satellite Communications System (DSCS) Multi-year Procurement: DSCS provides Super High Frequency (SHF) satellite communications for secure voice and high data rate transmissions. In FY 1985, a multiyear production contract with General Electric was initiated for seven DSCS III satellites. Production of the fifth and sixth satellites is programed for FY 1985, with the seventh and last DSCS III satellite under the multiyear contract programed for FY 1988.

GRH reductions could also adversely impact several other $C^3$ procurement programs which are being performed under existing firm fixed-price contracts. If budget reductions prevent the exercise of previously negotiated fixed price and quantity options, it may be necessary to renegotiate these contracts, most likely at a significantly higher price. Examples include: Mobile Subscriber Equipment (MSE) and Regency Net communications equipment.

Similarly, the development and, in turn, future acquisition of our most important and highest priority $C^3$ projects (e.g. Milstar, Ground Wave Emergency Network, E-6A Aircraft, Worldwide Military Command and Control System Information System, Over-The-Horizon Backscatter Radar, Combat Identification System, Joint Tactical Information Distribution System, and Inter-Service/Agency Automated Message Processing Exchange) could be seriously hampered if GRH reductions are incurred.

Mr. Latham. We signed up for 28 satellites with GPS firm fixed price and got them for about $40 million a piece. You blow that one, that is an example.

Mr. Dicks. If you had to renegotiate that, what do you think the price would be? What would you guess?

Mr. Latham. I would guess it wouldn't go up too much because Rockwell has been very successful in the long lead ordering and putting together of those satellites.

They are building them like popcorn and they have an efficient production line. It would probably go up some, probably 10 percent.

Mr. Young. Mr. Chairman, let me ask a question on that same subject.

DSP, for example, is a candidate for multi-year. If we multi-year DSP, we could get five in the place of four.

Mr. Latham. That is the estimate now.

Mr. Young. What is happening with the delay on the shuttle and with Gramm-Rudman-Hollings threatening the multi-year approach to the DSP?

Mr. Latham. Gramm-Rudman would, but I don't think the shuttle delay will threaten a multi-year contract. We are talking out-years for the multi-year satellites so I don't think that is a problem. Multi-year is the way to go on the DSP and transition to the new ——— in the out-years.

I would try more innovative techniques.

Mr. Young. It would be very ironic if Gramm-Rudman-Hollings, a device intended to reduce our deficits and get us more for the dollar, costs us money by eliminating multi-year.

Mr. Latham. Absolutely. Look at the F-16 multi-year. You are going to break all those contracts so the prices are going to go up very substantially I think in these areas.

Mr. Dicks. We had the B-1 under a multi-year contract. That could be broken. That would be a disaster.

Mr. Latham. That is right. Yes, sir. In fact, I am not sure. We were talking the other day about this, remember in the hearing the other day, and the real thing is that personnel are not excluded so if you have to take the money out of the personnel accounts, which Gramm-Rudman would force us to do under current law, some 300,000 or more people have to come off the books. That is incredible.

By the way, there is a report on the shuttle analysis that goes along with the vugraphs that is in draft now and will be reviewed Friday and presented to the President next week that summarizes the options and so on. It was jointly done between NASA and DOD with other agencies participating.

### JOINT CHIEFS OF STAFF MEMO OF POLICY 160 ON INTEROPERABILITY

Mr. Dicks. Joint Chiefs of Staff Memorandum of Policy No. 160 issued on January 7, 1986, appears to ensure that compatibility and interoperability for tactical command, control, and communications and intelligence systems will be achieved.

[illegible] AVAILABLE

Please comment on the following provisions in the memorandum:

First, with regard to establishment of requirements, the Director of the Joint Tactical Command, Control, and Communications Agency (JTC3A) "coordinates" with the services, CINCS, or defense agencies if he finds that requirements are not in line with joint tactical C3 architecture and standards. If he is not happy with this coordination, he sends the issue to the Joint Chiefs of Staff.

Are you satisfied that the Director of the JTC3A has been given enough clout in this instance?

Mr. **LATHAM**. No, I am not. I don't think he has and that is a carefully negotiated situation in that the charter and the establishment of the JTC3A was negotiated with the JCS and the services, and the only way we could get it through was to limit the scope and authority that the Director of JTC3A has. He does not set requirements. Those are done by the CINCS and the JCS. The Director, JTC3A is a watchdog on requirements as the statement says, but he has very little police power to do anything about it if somebody doesn't adhere to certain interoperability standards or other things.

He can call it to my attention and I can raise the dickens in the Joint Staff or in the services, so there is a way to make it happen, but it is an arduous way to do things and the services and the Joint Chiefs would not stand for any further power there.

Mr. **DICKS**. Second, with regard to production, the memorandum says that a program "must not enter production without decisions concerning joint or combined compatibility and interoperability."

Does this provision mean that achievement of compatibility and interoperability standards is necessary for production approval or for service use approval? If not, shouldn't it?

Mr. **LATHAM**. I believe that is what the intent is yes and in the DSARC process we are insisting on those factors being considered in the selection of equipments, as an example, the SINCGARS radio. VHF SINCGARS radio is going to be fully compatible and interoperable across all four services, air and ground.

We are making an issue about that point.

The JCT3A is the holder of the so-called JINTACCS program, the acronym for the program that is doing the testing and development of the standards for interoperability across tactical programs, and that is working.

Mr. **DICKS**. Are you satisfied that this provision is strong enough?

Mr. **LATHAM**. I think so. I think we have enough clout to make interoperability and compatibility work.

Mr. **DICKS**. With respect to testing, "Systems with joint or combined interfaces will be modified and retested until certification is achieved . . . and will not be employed in joint or combined operations until certified."

This provision appears to be very strong. Is that your reading of it?

Mr. **LATHAM**. Yes, sir.

Mr. **DICKS**. Are these systems subjected to independent testing?

Mr. **LATHAM**. Yes; they are. The independent DT&E and OT&E testing will occur on these programs as well, so that let's take JTIDS. That is a joint program, Army, Navy, Air Force, Marine Corps.

Each of the individual services has a test program, but there is also a joint test program for ensuring interoperability and compatibility of JTIDS across all the spectrum of weapon systems platforms.

Mr. Dicks. This JCS memorandum revises a November 1, 1976 document. Earlier attempts at revision in 1980 and 1984 failed. Obviously it is not without controversial issues.

Are you satisfied in general that this document has sufficient teeth to do the job?

If not, would you please outline for the committee your position on what further needs to be done to ensure compatibility and interoperability of tactical C3I systems?

Mr. Latham. The document, as we have it today, is a new DOD directive issued and updated. It hasn't been updated since the sixties. Senator Goldwater said, "I am not going to give you money in this area unless you produce a new document that really addresses interoperability," and that was enough stimulus to get the service and JCS to agree to it.

I think we have enough teeth in that to make it happen, and I don't think we need any more right now.

Mr. Dicks. A key provision of the memorandum MOP 160, seems to be the establishment of a tactical C3I interoperability improvement program that features annual identification of issues, and a system for prioritizing and funding the ones that should be dealt with first.

Do you anticipate that this improvement program will play an important role in achieving interoperability?

Mr. Latham. Yes, I do.

Mr. Dicks. When will the first review take place?

Mr. Latham. You have got me there. I don't know.

[The Information follows:]

With the approval of MOP 160 in January of 1986, the JTC$^3$A has begun organizing the mechanics of the Interoperability Improvement Program with the CINCs, Services, and agencies.

The process is complex due to the large number of organizations involved and the many different requirements. We anticipate first meetings in the near future leading to a "first cut" list of interoperability issues.

In the interim, LTG C. E. McKnight of the OJCS and I have provided the JTC$^3$A with priority issues to work.

Mr. Dicks. How will these annual reviews plug into the budget process to earmark funding for the high priority items identified?

Mr. Latham. What we do, we have held one annual review already. The next is scheduled in May. We identified across the Services what needs to be fixed and make an estimate and we try to get that cranked into the Service POMS.

Mr. Dicks. The gentleman from Florida, Mr. Young.

Mr. Young. Mr. Chairman, I don't have any further questions at this particular time.

Mr. Dicks. The gentleman from Pennsylvania, Mr. Murtha.

Mr. Murtha. No questions, Mr. Chairman.

Mr. Dicks. The gentleman from Ohio, Mr. Miller.

Mr. Miller. Thank you, Mr. Chairman.

Earlier when we were talking about Stealth and the fact that the Soviets were ———.

Is this a big obstacle for the Stealth itself?

Mr. **Latham**. No, it isn't ———.

### INTEROPERABILITY WITH NATO

Mr. **Miller**. With regard to the interoperability of our communication systems and NATO, we are working along the same lines, but are we covering all of the items so that we will be able to communicate with the NATO forces and they communicate with us?

Are we building a massive communications system that stands out by itself? What interconnection do we have so that in the case of war we would be able to actually communicate with NATO forces?

Mr. **Latham**. That is a good question and a complicated one to answer in a few minutes.

There is a NATO-integrated communications system that is paid for by all the member nations. It is funded and operated out of infrastructure funds of which we contribute 28 percent. That communication network is operable across all NATO nations, extending across all regions, and that communication system is being interconnected to national PTT's, the telephone networks of the various nations as well.

We have worked with the NATO-integrated Communications Management Agency which is the procurement and installation and operator of those NATO systems to make sure they are secure and interoperable, so there is a backbone set of equipment that is fully interoperable with everybody in NATO.

Then there are the national systems and that is the real question, are the national systems that we would bring into the theater or that are already there, interoperable?

In the case of satellites, the NATO and U.S. DSCS are interoperable. Are we interoperable with tactical radios?

We have made provisions such as through gateways. You can get from our system into the British or German or French system and the gateways have to be able to handle the transmission issue as well as the COMSEC issue that goes across the gateways, so it is arduous in some cases to have full, interoperability in real time through these systems.

For example, in the combat net radio area, the TVH SINCGARS radio, we are not electrically interoperable with any of the NATO nations with those radios because everybody has their own view of how to build one of these radios. For example the British view is you don't need a jam-resistant radio.

So the way we will interoperate across NATO at the tactical level is that we will exchange liaison teams that have U.S. radios, U.S. soldiers who speak German, and we will operate that way.

It is simpler than trying to make everybody have the same radio. So it is a complicated problem, not easy to solve.

Mr. **Miller**. You have brought up another question, the language barrier; hopefully the liaison people will be able to speak German or French or whatever it may be.

Is it possible to communicate so that we would have a French person speaking and this could be translated and received as English on the other end? In other words, we transcribe right now in code. Can we break it down that way?

Mr. Latham. We don't have a real time on line electronic translator capability. You would have to use linguists to do that. In other cases like air traffic, all the command and control and voice instructions to the German Luftwaffe aircraft, that is done in English, so that we can in fact have one language to handle certain operations.

In most cases we will have liaison teams at the ground level who speak the languages of the forces on either side of them.

### EXTREMELY LOW FREQUENCY [ELF] SYSTEM

Mr. Miller. You undoubtedly were deeply involved in the system that was being installed in Michigan concerning communications with our submarines.

Mr. Latham. Yes. sir.

Mr. Miller. Is that completed? Can you give us a little background on it? It is a big thing, I understand.

Mr. Latham. It is not that big a thing. It is about a total of 86 miles of above-ground wire hung on wooden poles in two different locations. It is 24 miles in one location and 56 miles in another. It is in two states and interconnected between the two stations which is a small control building, with a telephone line to coordinate the two transmitters.

The total cost of R&D and installation is modest on the scale of things. It is a few hundred million dollars at most. We are building receivers for ——— today. The experimental site in Wisconsin is operating and it has enabled us to prove that we ——— so that system is extremely valuable in keeping the submarine force fully alerted as to what is going on in the world.

If the signal ceases by malfunction or destruction, the submarines are instructed to ——— to immediately try and find out what is going on so they can stay in contact with the shore.

It is a bell ringer. At the very low data rate at which it operates it sends by coded messages having prearrange what certain symbols mean—a large amount of information can be conveyed with the system.

It will go fully operational in ———. It will be partially operational in ———.

Mr. Dicks. It is operational now?

Mr. Latham. The ELF facility is not operational yet. ———.

Mr. Miller. In the beginning, as I understand, that signal would only reach the submarine to tell them to come to the surface to put an antenna up. Now you are talking about that signal coming directly to the submarine ——— and giving a message?

Mr. Latham. Yes, sir. In fact, that signal will ———.

Mr. Miller. Did technology change in the few years from when this was first planned to just give a signal to the submarine to surface and put up an antenna?

Mr. Latham. No, sir. However, it has been the most controversial program you could ever imagine. It has been around for 20 years. It was invented that long ago and because of environmental impacts and all kinds of hate and discontent and charges that it was going to kill bees and sterilize humans and everything else, it got delayed.

We finally convinced everybody that it wasn't going to hurt anything. You can't believe the exhaustive things we had to do to prove that the signal would not hurt anything.

This operates at around 70 to 80 hertz. Your electric lights are at 60 hertz and you have high power signals going off your electric lines all over this country that carry power at hundreds of thousands of volts and in fact you have probably seen or heard of farmers that have had light bulbs hung on their barbed wire fence lit from the power radiated from the power lines.

It has been a whole bunch of old wives' tales, but it is going on.

There are those, however, who believe that it still ought to be stopped and that there is new technology to replace it such as satellite laser communication systems at a cost of billions of dollars.

Mr. DICKS. That is way down the road, too.

Mr. LATHAM. Yes.

Mr. MILLER. When you speak of this reaching any submarine in the world, are you talking about relay units being in other countries or are you talking about the signal going to satellites———

Mr. LATHAM. No. The signal will radiate from the Michigan and Wisconsin sites and it will go all the way to the Indian Ocean and a submarine trailing a wire in the Indian Ocean can receive the signal generated at that transmitter site ———. It is at such low frequency that there is a path through the earth that the signal actually follows as well as a path through the atmosphere. It closes the loop back through the earth and you can get global connectivity.

Mr. MILLER. I thought you had something new.

Mr. LATHAM. No, sir. It is still the same old laws of physics.

### E-6A TACAMO PROCUREMENT

Mr. DICKS. I understand the Navy has reached agreement with the Boeing Airplane Company on an E-6A procurement program at a not-to-exceed price of $1.478 billion. The aircraft unit price in this program is $62 million, about $3.7 million per aircraft less than Boeing's original not to exceed proposal. In addition, support costs have been reduced by $50 million and the Navy and Air Force are working together on common training support and joint support basing to further reduce operating costs. In light of these developments, is the department satisfied with the contract arrangements?

Mr. LATHAM. Yes, we are.

Mr. DICKS. Does this reinforce your conviction that the E-6A is the cost-effective option for replacing the EC-130 for the TACAMO mission?

Mr. LATHAM. Yes, I believe that.

Mr. DICKS. What is the present status of E6A funding? Is this progam proceeding as planned?

Mr. LATHAM. It is proceeding as planned. The Congress has before it the President's fiscal year 1987 request and there is money there for the TACAMO E6A program. We are dependent on that in the out-year funding to complete the program, but now everything is moving along and we have the current money committed and used.

Mr. **Dicks**. Secretary Paisley recently testified that he was confident that the E6A was a low-risk program. The Director, Operational Test and Evaluation, has also judged it to be a low-risk program that should proceed as planned.

Do you agee with these assessments?

Mr. **Latham**. Yes, I do.

Mr. **Dicks**. The Congressional Budget Office recently released a report, "Reducing the Deficit: Spending and Revenue Options." It suggests an option of cancelling E6A procurement for a savings of $1.5 billion over the next five years. Do you agree with this assessment?

Mr. **Latham**. No, I don't, because you are not doing away with the mission. You are going to still have to procure additional C-130's. A number of air frames will have to be replaced and you will have to buy more C-130's in order to cover the TRIDENT operating area, so there is no savings at all.

Our estimate is you may spend more.

Mr. **Dicks**. And wind up with a less capable aircraft without the endurance?

Mr. **Latham**. That is right.

Mr. **Dicks**. Given sunk costs and contract termination costs, aren't there costs to a termination option that CBO does not include in their analysis?

Mr. **Latham**. I believe that is correct.

Mr. **Dicks**. I would like to place some material in the record at this point on that question.

[The documents follow:]

OFFICE OF THE CHAIRMAN
THE JOINT CHIEFS OF STAFF
WASHINGTON D C 20301

14 April 1986

Honorable Norm Dicks
Subcommittee on Defense
Committee on Appropriations
House of Representatives
Washington, D.C. 20515-4708

Dear Mr. Dicks,

In response to your recent letter the Joint Chiefs of Staff continue their strong support for the E-6A TACAMO replacement program. The E-6A is the optimal platform to support modernization of the TACAMO communications system and, as such, is vital to our ability to communicate with our strategic submarine missile fleet, particularly, the TRIDENT force. Only the E-6A offers assured survivability of communications in a nuclear attack and post-attack environment. The E-6A enjoys top priority in the Defense Department's FY87 budget request and is in keeping with the President's guidance that strategic C3 is a first priority.

The Congressional Budget Office report that implies canceling E-6A procurement would result in a $1.5 billion saving over the next 5 years is misleading. The increasing deployment of TRIDENT submarines into the Pacific theater significantly increases the demands on connectivity. Improvements in strategic connectivity are essential to maximizing the performance gains the expanded TRIDENT deployment provides. Without the E-6A, these demands can only be met in the near term by procuring 13 additional EC-130s and improving the EC-130 fleet (to equal the coverage the E-6A provides but not the survivability or endurance). This would require the development/procurement of an additional 13 new communications suites which would further delay achieving this capability until the mid-1990s. Our analysis shows that the 20-year life cycle costs of an expanded EC-130 fleet would be significantly greater than for an E-6A fleet.

I welcome the Secretary of the Navy's recent decision to proceed with the production phase of the E-6A program. The E-6A program has been carefully scheduled to assure maintenance of the required 24 hour-a-day, two ocean survivable connectivity to the submarine ballistic missile force as the phaseover from EC-130s to E-6As takes place. To minimize costs, key equipments from the EC-130s are removed and used in the manufacture of the E-6As. In Secretary Lehman's recent testimony before the House Armed Services Committee, he stated that it would not be cost-effective to slow or curtail E-6A procurement at this point. Given the President's emphasis on Strategic Force Modernization, the E-6A program is a must-fund item in the FY87 budget.

AVAILABLE

The addition of a satellite laser capability would provide a much needed redundant, assured means of communicating with submerged submarines during wartime. The ultimate survivability of such a system will depend on design features such as those currently being developed for MILSTAR. However, our current estimates are that a fully operational capability will not be possible until the year 2000 with life cycle costs approaching $6-10 billion.

Thank you for your interest in this important asset. I hope you will support the E-6A TACAMO replacement program. I am sending a similar response to a letter from Congressman Davis on this subject.

Sincerely,

WILLIAM J. CROWE, JR.
Chairman
Joint Chiefs of Staff

## BLUE LASER COMMUNICATIONS

Mr. **Dicks**. I would like to go into—for several years, the Navy and DARPA have been examining the possible use of blue laser communications with our submarine forces. What is the status of this effort, and what is requested in this budget for the program?

Mr. **Latham**. The budget request is a very small amount of money in the Navy budget for about $6 million. The status is that the critical components for the proof of the technology are in development and would be entering test in the 1987 time frame to see if you can build a space-qualified laser and other componentry that would be critical to building a so-called blue laser satellite communication system.

So the jury is still out as to whether it is even technically feasible. The two overriding questions, are even if technical feasibility is shown to be real, can you afford it and how do you survive it?

Mr. **Dicks**. Some have suggested that we could forego near-term improvements in submarine communications, including the ELF system and the E-6A TACAMO replacement while accelerating blue laser communications.

Does the Navy agree with this assessment?

Mr. **Latham**. I do not think so. I have seen that briefing. It is flawed. It is a Lockheed briefing supported by Northrop. I don't believe that the Navy supports that at all.

The briefing contends that the technology is here today to go ahead.

It isn't, and also their cost numbers are extremely suspicious.

Thirdly, the way they get the total cost down is to claim that they can do adequate coverage with only a two-satellite constellation.

Mr. **Dicks**. I have a couple other questions on the subject for the record.

[Clerk's note.—Questions submitted by Mr. Dicks and the answers thereto follow:]

*Question*. What questions remain to be answered in this research effort? Is there an element of risk still involved in translating this concept into an operational system?

Answer. There is still considerable risks in developing an operational system. Specific areas of concern are in both the technical and operational areas. Technically, the laser has to be reduced in size and weight; made space qualified and tested in a typical satellite environment. The techniques for focusing and directing the laser beam and its required life expectancy have not been demonstrated. Operationally the data rate and message capacity have not been determined. Additionally, coverage areas, number of satellites, survivability, message injection and satellite control have yet to be determined. There will likely be additional unknown technical problems which will impact cost and schedule as this program matures.

*Question*. Some have suggested that we could forego near term improvement in submarine communications including the ELF system and the E-6 TACAMO replacement while accelerating blue laser communications. Does the Navy agree with this assessment?

What is your best present estimate is to when an operational blue laser system could be in place?

What would it cost?

Answer. No. The current estimates are that the Navy Submarine Satellite Laser Communications (SLC) program will not be able to provide the current message volume or time-of-receipt capabilities now required and satisfied by ELF/VERDIN/TACAMO. The planned improvements to these existing systems are essential to maintaining an acceptable level of strategic communicationis connectivity and cannot be delayed. The schedule estimate for deploying a SLC developmental satellite program is FY-95/99. The cost for deploying an operational constellation is dependent on the number of satellites (not now determined). Current estimates are five billion to nine billion ($FY86).

[CLERK'S NOTE.—End of questions submitted by Mr. Dicks.]

### MOBILE SUBSCRIBER EQUIPMENT [MSE]

Mr. DICKS. The budget request for the mobile subscriber equipment program in fiscal year 1987 is $903.7 million, or about one-fourth of the $3.7 billion requested for all Army communications and electronics equipment. And the MSE increase over fiscal year 1986 is 75 percent of the increase for all Army communications and electronics equipment.

Why wouldn't lower level of effort be justified for this program in the context of the stringent budget pressures that we face?

Mr. LATHAM. You could do that and you are forcing a proportionate delay in the program if you refuse the requests. The intent, as I said, is to completely buy the equipment out, test it and equip the Army and Guard and Reserve in five to six years. If we can't get that level of budget request, it becomes seven or eight years and the prices go up.

### SINGLE CHANNEL GROUND AND AIRBORNE RADIO SYSTEM (SINCGARS)

Mr. DICKS. The SINCGARS program has come to a stop. The committee understands that the contractor has asked the Army to reduce mean time between failures from 1250 hours to 600 hours, and that the Army is considering options from termination to non-developmental procurement.

This situation involves a definite requirement for a newer, more capable generation of combat radio, and it involves a lot of sunk time and money by the DOD.

Would you please bring us up to date, Mr. Latham, on the key aspects of this serious situation?

Mr. LATHAM. Yes. I will summarize it and add additional material for the record.

Last Friday, the President of ITT met with Mr. Ambrose, the Undersecretary of the Army. I have been also in communication with the Chairman and Chief Executive Officer of ITT, and they have taken extraordinary steps now to try and improve the status of the program.

In fact, I happen to have with me an Army memo that summarizes the status of the program that I could submit for the record that indicates the specific things that ITT has agreed to do to put the program back on track.

So Mr. Ambrose and I are going to then re-review this in the middle of May and we are then going to have a DSARC level review at the end of May to assess how serious the problem is and is ITT on the road to fixing it.

Right now it appears very serious.

[The information follows:]

### INFORMATION PAPER

Subject: SINCGARS
Issue: Status of the SINCGARS Program
Facts:

1. The Under Secretary of the Army and Mr. Carpenter, President, ITT, met on 14 April 1986 to discuss the status of the SINCGARS Program.

2. ITT presented a briefing to the Under Secretary of the Army and the major points were:

a. ITT has made a commitment of people and resources to fix the reliability and producibility problems.

b. ITT has increased its reliability staff by 35 people as of 14 April 1986.

c. ITT initiated a Test-Analysis and Fix (TAAF) program and has identified significant failure patterns. ITT has a structured method in place to attack and solve these failures.

d. ITT has instituted 100% screening of all vendor materials.

e. ITT has committed capital to include burn-in, when appropriate, in the manufacturing process.

f. ITT has instituted a reliability improvement program on a structured basis.

g. ITT is committed to the redesign of certain radio modules. Some can be accomplished in the near-term while others will require some time.

h. ITT agreed to meet in mid-May to review the results of current reliability, producibility, and design assessments and to support a review of the program by DSARC principals in 20-30 May timeframe.

i. ITT is committed to cut in fixes to the production line when fixes are ready.

j. ITT has contracted for two independent assessments by outside firms. One assessment is for reliability and the other for producibility.

k. ITT will increase automation of the insertion process from the current 32% to above 60%.

l. ITT will expeditiously submit Engineering Change Proposals (ECP) for their redesign efforts.

m. The Army and ITT committed to proceed expeditiously with establishing a second source procurement. The second source contract will be structured to include the second source in efforts to improve the design for producibility and reliability.

3. The $102.1M in FY86 is required for the second source buy. The Army deferred the 3rd option of 16,000 radios from FY86 to FY87 to allow ITT to fix their reliability problems and to pass follow-on evaluation. The $204M in FY87 is still required for the exercise of this option in FY87.

Mr. DICKS. We have further questions on that.

[CLERK'S NOTE.—Questions submitted by Mr. Dicks and the answers thereto follow:]

*Question.* First, what went wrong. Why are we at this crossroads? What are the major alternatives for a way out of this situation, and what are the pros and cons of each?

Answer. The SINCGARS Program has not come to a stop but has encountered some delay in entering full scale production due to the contractor's inability to formally enter production readiness acceptance testing (PRAT). Work on improving the reliability of the radio continues and we hope to be able to enter testing in June 1986.

The contractor has realized significant difficulty in producing a radio that will meet the specified mean time between failure of 1250 hours. This is due, in part, to known quality control problems, a new and less than adequately trained work force and in some instances probable design deficiencies in some of the radio's components. The contractors has recently taken some positive management and engineering actions designed to resolve the outstanding issues. The Army is working closely with them to identify those actions necessary to get the program into PRAT in the June timeframe.

Because of these program difficulties, a DSARC-level program review has been scheduled in late May 1986. At that time, the Army will address the current status of the program, the outlook for entering full scale production, the possibility of bringing on a second production source in 1986, the existing reliability and maintainability issues and the available alternatives should the current program continue to falter.

The Army is currently in the process of assessing several alternatives which could be implemented if necessary. As part of this assessment the Army will evaluate several off-the-shelf VHF-FM radios as possible candidate SINCGARS radios should the current SINCGARS Radio contract be terminated. The results of this assessment are not yet available from the Army so it would be premature for me to discuss the pros and cons of any alternative at this point. However, let me assure you that this program has the highest level of attention with DOD and a careful assessment by OSD of each alternative will be made. The Congress will be advised of any significant change in this highly important program.

[Clerk's note.—End of questions submitted by Mr. Dicks.]

## GROUND WAVE EMERGENCY NETWORK [GWEN] PROGRAM

Mr. Dicks. We have some questions from Mr. Conte that we will put in the record on the GWEN system.

[Clerk's note.—Questions submitted by Mr. Conte and the answers thereto follow:]

### MISSION AND CAPABILITIES

*Question.* In an earlier version, the principal mission of GWEN was to convey positive control launch messages to the bomber force.

Will you please tell the Committee the three or four principal intended uses of GWEN as it is requested in the FY 1987 budget?

Is GWEN, in its present configuration, intended to transmit execution messages to all three legs of the strategic nuclear triad?

If so, has the change in emphasis altered which relay stations and terminals for sending and receiving messages will be procured first.

Please compare the principal missions of GWEN and ELF?

Answer. When fully deployed, the GWEN system will interconnect the AW/AA sensor sites, command centers, aircraft bases and missile launch control centers. During the pre-attack or crisis management phase, the system will be used to operationally pass warning data from the AW/AA sensors of the NMCS, NORAD and SAC command centers; in addition, SAC will use the system to transmit exercise positive control launch (PCL) messages, ———.

GWEN is not intended to transmit execution messages to all three legs of the strategic nuclear traid. The Minuteman force is the only leg of the triad capable of receiving GWEN LF transmissions directly. Bombers on the ground receive the GWEN LF transmissions via the AACE system which would relay both PCL and ———. Once airborne, the bombers would rely on ———. The submarine force cannot receive GWEN transmissions directly, but messages carried by GWEN may be relayed to SSBNs via a variety of means.

The principal mission of GWEN is as stated in A and B above. The mission of the ELF system is to enhance submarine survivability. ELF allows the submarine to operate at depths which are beyond the reach of more conventional means of communications. However, if required, the ELF system can direct the submarine to come closer to the surface where it could receive an execution message from surviving VLF systems such as TACAMO.

*Question.* What communications systems do we now use to convey messages between the National Command Authority, the strategic forces, and the senors that GWEN will connect?

What are the principal capabilities of GWEN that justify procurement of another strategic communications system?

Answer. ———.

### STRATEGIC PURPOSE

*Question.* A New York Times article (2/17/86) reported that *anti-nuclear activists* in Amherst, Massachusetts "have charged that the (GWEN) system reflects the view that a 'protected' nuclear war is feasible." An *Air Force fact sheet on GWEN* states flatly that GWEN is not meant to be used to fight a prolonged nuclear war.

The same NYT article characterizes you, Mr. Latham, as favoring expansion of GWEN to help direct nuclear weapons in a war that could last for days, weeks or longer. Would you please put your remarks in this article in context and comment on whether GWEN is intended to fight a prolonged nuclear war.

Please state in positive terms the stragegic purpose of GWEN.

Answer. We do not seek to fight a protracted nuclear war or any nuclear war for that matter. Our policy is to deter all forms of nuclear attack which the Soviets are capable of launching. The GWEN Communications system is a major element in our deterrent equation. The system provides sufficient doubt in the minds of the Soviet planner of his ability to launch an attack without fear of retaliation.

The strategic purpose of GWEN is communicating vital information and commands during the opening minutes of a Soviet nuclear attack against the United States. The Department of Defense (DOD) is evaluating the merits of eventually expanding the GWEN network beyond the planned 127 relay stations. A larger number of relay stations could permit greater flexibility and survivability. I have expressed support for enhancing the effectiveness of the GWEN system through expansion, and this is under review within the DOD.

### SURVIVABILITY

*Question.* Mr. Latham, please comment on two points made by Mr. Bruce Blair, who is cited in the NYT article as a strategic communications expert.

Relay towers can transmit about 200 miles and tens of weapons directed at specific relay towers would be sufficient to "dismember the network into essentially useless segments."

There is no rationale for building a system for a long nuclear war because the bomber bases, missile fields, underground command posts and radar installations linked by the system are important and vulnerable targets and would be destroyed.

Answer. The DOD recognizes that GWEN stations are unhardened and not survivable to direct nuclear attacks. As a survivability as a communications asset if the Soviets elected to directly attack GWEN nodes.

It appears that Mr. Blair is unaware of the current DOD initiatives with respect to the Small ICBM, the CINC mobile command center program, the inherent survivability of our airborne command post and radio relay aircraft, ——— or that some portion of the bomber force assigned to the secure reserve force might survive. Additionally, as Secretary Weinberger has stated repeatedly, because the Soviet leadership evidently has plans, and certainly has capabilities, for protracted nuclear conflict, we must deter such an attack by maintaining highly survivable and enduring capabilities ourselves.

*Question.* What is your position on the priority the Soviets, in time of nuclear war would place on neutralizing GWEN versus eliminating other targets?

Answer. While we do not know what the Soviets are planning to attack, I consider such an attack very unlikely. It would require a larger number of Soviet warheads and would likely be considered by Soviet target analysts a low-priority target in comparison to other strategic targets.

*Question.* Mr. Franklin C. Miller, Director of Strategic Forces Policy in the DOD Office of International Security Policy, is reported by the NYT article as saying that GWEN would deter the Soviet Union from detonating high-altitude nuclear blasts early in an attack for the purpose of disabling electronic components. "The system is important for the first 35 minutes of an attack."

How long, in your view, can GWEN survive in a nuclear war?

Answer. I agree completely with Mr. Miller's view of the deterrent effect of GWEN. Our whole purpose is to deny the Soviets any idea that EMP could disable our $C^3$ sufficiently—that we would not be able to retaliate. To answer your specific question, if the Soviets elected to directly attack the GWEN nodes, it could only be expected to survive a length of time equal to the flight time of the weapons attacking it.

### REQUIREMENTS AS RELATED TO THE THREAT

*Question.* A recent Air Force study reassessed the threat to GWEN and lowered the number of relay stations required from 236 to 127. The NYT article quotes you as saying the current plan "is an Air Force temporary position that I absolutely do not agree with," and that the Air Force position reflected budgetary concerns.

Would you please comment on the threat to GWEN as you see it from:

Submarine launched ballistic missiles?

Sea launched cruise missiles?

Jamming?

What in your view is the required number of relay stations under GWEN's present configuration?

Answer. The threat to GWEN which was developed by the Air Force and coordinated on by the Defense Intelligence Agency consists ———. At these distances, the jammer would be subject to counterattack from our conventional forces.

For the current GWEN mission and the assumed threat, 127 GWEN nodes is sufficient. But other missions and a more realistic threat could require additional nodes.

### FUTURE EXPANSION OF THE GWEN SYSTEM

*Question.* The DOD is reportedly considering new uses for GWEN, including command, control, and communications for air refueling aircraft, fighters, AWACS, air defense and small ICBM. This expansion would involve extension of the network into Alaska and Canada.

In the long term, how many GWEN relay stations will be needed to meet this expanded mission?

Will the addition of such relay stations increase GWEN survivability? If so, how?

Answer. As I stated earlier, the number of nodes required for the expansion of the GWEN system is under study by the DOD. Technically, the number of GWEN nodes required to provide connectivity between two users is dependent upon the distance separating them, the conductivity of the ground between them and the amount of redundancy required to ensure a specified communications performance. Until the additional uses of GWEN are validated and the characteristics of the path are determined, it will not be possible to determine the required number of GWEN nodes.

The addition of these relay stations will increase the survivability of the GWEN system. The increased survivability is obtained because the greater number of nodes will increase the number of redundant paths between any two points in the GWEN system.

[CLERK'S NOTE.—End of questions submitted by Mr. Conte.]

Mr. DICKS. I will turn the hearing over to the chairman.

Mr. CHAPPELL (presiding). Thank you, Mr. Dicks.

### OVER-THE-HORIZON BACKSCATTER RADAR

The over-the-horizon backscatter radar is intended to provide early warning of bomber and cruise missile attacks on North America.

A July 1985 Defense Intelligence Agency assessment indicated that a ———.

Doesn't this change in the threat mean that the OTH-B is likely to ———?

Mr. **Latham**. If the assessment that you read was carried out, that is that they ———.

[**Clerk's note**.—Classified discussion removed.]

Mr. **Chappell**. How many of these have been funded?

Mr. **Latham**. I will have to take that for the record.

Mr. **Chappell**. Our information is four of the twelve.

Mr. **Latham**. I believe three East Coast sectors and the sector for the East Coast, but the others are in the out-years. I will have to check that.

[The information follows:]

We have funded the three East Coast sectors, which completes the East Coast system and one West Coast sector with long lead funding for the other two West Coast sectors. In FY 87, we are requesting the rest of the funding for the remaining two West Coast sectors. This will complete the West Coast system.

Mr. **Chappell**. Would the money for OTH-B be better spent advancing space-based radar, rather than on construction of a costly interim system of questionable effectiveness?

Mr. **Latham**. It wouldn't. I think that the OTH is not an interim system. I would see us keeping this around as a detection and tracking system for a very long period of time.

Secondly, ———.

Mr. **Chappell**. Teal Ruby is an experimental satellite?

Mr. **Latham**. That will be launched whenever we get the shuttle backup and operating.

[**Clerk's note**.—Classified discussion removed.]

Mr. **Chappell**. Are the requirements of the ——— program sufficiently addressed under the new arrangement?

Mr. **Latham**. I think they are. The SDI people originally had some very stringent requirements that they were going to put on BSTS. I think those have been relaxed such that the requirements for attack assessment, attack warning and what SDI needs are about the same.

Mr. **Chappell**. What is the current schedule for operability for the Consolidated Space Operations Center?

Mr. **Latham**. I don't know. I will have to get you a date on that. I don't know, Mr. Chairman.

[The information follows:]

[**Clerk's note**.—Classified insert removed.]

## CONSOLIDATED SPACE OPERATIONS CENTER (CSOC)

Mr. **Chappell**. Are you satisfied that the military mission capabilities of the CSOC have not been degraded significantly both for the purposes of managing shuttle operations and of controlling military satellites?

Mr. **Latham**. That question is getting at the heart of the issue that was debated rather hotly as to should you include in the CSOC the capability to do orbiter system control that we now do at Johnson Space Center and put that additional capability in.

The decision in the current time was not to do that. If you did do it, it would be an out-year initiative.

Right now I believe the Air Force has tentatively said that would get started in fiscal year 1990 or 1991 if they did it at all.

So you have an austere CSOC, meaning it does all the missions intended except this shuttle management real time operation center.

Mr. **Chappell**. What is the initial purpose of the CSOC, Mr. Latham?

Mr. **Latham**. To consolidate in one facility the command, control, and operations of all space assets for the Department of Defense.

Mr. **Chappell**. So you wouldn't have to depend just on NASA?

Mr. **Latham**. So you wouldn't have to depend on places like Sunnyvale to control your satellite systems. As a result you would have more survivability and more capability.

### ELECTRONIC WARFARE

Mr. **Chappell**. Existing tactical self-protection electronic warfare systems, according to assessments of the tactical air command, provide ——— used to guide air defense missiles both surface to air and air to air.

Do you agree with this assessment ———?

Mr. **Latham**. No, I do not. All four of those systems, ———.

Mr. **Chappell**. When will the ——— go into it?

Mr. **Latham**. I will have to take that for the record, Mr. Chairman. Provisions have been made for it.

[The information follows:]

The ———, with forward and aft coverage, is part of the baseline ALQ-161 system and is being installed on the production aircraft.

Mr. **Chappell**. You are not making the installation now?

Mr. **Latham**. They have made provision for it, but not put it in.

Mr. **Miller**. Mr. Chairman, before you leave that section, could I ask a question?

Mr. **Chappell**. Mr. Miller.

Mr. **Miller**. Could you give us a little additional information on the Soviet ——— as to how it functions and are we using the same thing?

Mr. **Latham**. We have had ——— around for a number of years and so, yes, it is a technique that is very well known, written up in ordinary textbooks. The Soviets had them in the seventies. These appeared in numerous variations, ———.

One of the issues is that of how do you justify a program to build a counter to something until you have hard evidence in hand from an intelligence source that says they have got it.

While we projected they were going to have it for several years, nobody was willing to put the money up to start on countermeasures to ———.

Now that we have hard evidence, finally the system is willing to let us go ahead and build in the countermeasures, so we are in fact today ———.

Mr. **Miller**. Are ———?

Mr. **Latham**. There is no ———.

I can get diagrams and come over and show you how that works, but it is a technique that is fairly simple to implement and as a result it is more difficult to counter.

We were just late in getting our act together to counter those threats, and yet we had ——— years before that. We knew they were coming.

Mr. **Miller**. Thank you.

Thank you, Mr. Chairman.

### GWEN

Mr. **Chappell**. Mr. AuCoin has some questions he would like you to answer for the record.

[Clerk's note.—Questions submitted by Mr. AuCoin and the answers thereto follow:]

*Question.* Director of Strategic Forces Policy Franklin Miller has described GWEN as primarily intended to function in the first few minutes of a strategic nuclear conflict, primarily leading to bomber base escape. In contrast, you have described it as a long-term endurance system. Which is the official DoD position?

Answer. The statements of Mr. Miller and Mr. Latham do not reflect any disagreement within the Department of Defense (DoD) about the role of GWEN. Both strongly support the construction of the planned GWEN network, consisting of an initial 127 relay stations, for the purpose of cummunicating vital information and commands during the opening minutes of a Soviet nuclear attack against the United States.

The DoD is evaluating the merits of eventually expanding the GWEN network beyond the planned 127 relay stations. A larger number of relay stations could permit greater flexibility and survivability to support other vital DoD missions. Mr. Latham has expressed support for enhancing the effectiveness of the GWEN system through expansion. This is under review within the DoD.

*Question.* How many GWEN stations do you believe should be built?

Answer. for the current GWEN mission and the assumed threat, 127 GWEN nodes are sufficient. If the mission of GWEN is expanded, the number of GWEN nodes will have to increase.

*Question.* How many Soviet warheads would be required to deprive a 127-node GWEN systems of strategic effectiveness as national network? Is there any reason to believe the Soviets would not dedicate that number of warheads to that mission?

Answer. The number of warheads required to begin to degrade the effectiveness of the GWEN system ———.

*Question.* Considering a 56-node system vs. a 127-node system, what would be the cost-exchange ratio between additional GWEN stations and additional Soviet warheads? If there were to be a continuing race of Soviet warhead expansion vs. GWEN expansion, is there any point at which the cost-exchange ratio becomes favorable to GWEN? Please supply all specific assumptions and calculations used in answering the two components of this question.

Answer. ———.

*Question.* Why is GWEN necessary if we will also have Milstar?

Answer. GWEN will provide a communications media which is ———. It will provide the needed redundancy at modest low cost to ensure control of our nuclear forces.

*Question.* GWEN's vulnerability seems to place us in dilemma. If it is a strategically significant asset, the Soviets presumably will take it out. If it's not, there would seem to be no reason to build it. Please give us your views on this.

Answer. GWEN is being constructed for its deterrent value. Its whole purpose is to deny to the Soviets any idea that EMP could disable our C3 sufficiently that we would not be able to order and control retaliation. If deterrence should fail, clearly, the GWEN system will perform the vital function of assuring the flow of essential communications.

*Question.* How do you plan to protect GWEN against ———?

Answer. ———.

*Question.* If survivable U.S. communications are stabilizing, does this also mean that survivable Soviet communications are stabilizing?

Answer. The impact of survivable Soviet communications facilities on stability cannot be properly assessed in isolation from the entire Soviet strategic force structure and the doctrine that animates that force structure. Since the early 1970's the Soviets have been engaged in a strategic buildup, encompassing both offensive and defensive forces, with the aim of significantly reducing the prospective impact of a U.S. nuclear retaliatory strike. This dedicated effort has also involved an enormous construction effort ——— which will allow Soviet leaders to survive personally a major nuclear attack. The totality of the evidence indicates that a nuclear warfighting doctrine underlies Soviet strategic programs including command and communications facilities. This we do *not* consider to be stablizing.

*Question.* In choosing sites for GWEN towers, what consideration is given to the surrounding population density at risk if the tower were to draw enemy fire?

Answer. As stated above, GWEN is required to strengthen our ability to prevent a nuclear war. Its very presence and ability to provide assured communications will deny the Soviet planners the option of a preemptive nuclear strike and, as such, GWEN is a valuable deterrent to, rather than a target in, a nuclear war. However, to answer your specific question, site selection is not influenced by the impact on the surrounding population density if the tower were attacked. What does influence site selection, namely lease cost, tends to drive the placement of the towers, if at all feasible, away from areas with high population density.

*Question.* Will an Environmental Impact Statement be submitted for each GWEN tower?

Answer. No. To date, only an Environmental Assessment has been conducted for the TLCC towers. If required, an Environmental Impact Statement will be submitted. However, this will be done on a case-by-case basis.

*Question.* Will local land use procedures be followed before commencing construction of a GWEN tower?

Will local zoning laws be respected?

Will USAF or DoD representatives take part in public hearings convened in accordance with local land use procedures?

Answer. The Air Force has always complied with State and local government rules and regulations prior to installation of GWEN sites. The Army Corps of Engineers acquires all real estate for GWEN. They contact State and local authorities to obtain building permits, review zoning, and fulfill requirements unique to each site location prior to system installation. The only exception to this would be local regulations enacted with the express intent to prevent the construction of a GWEN relay node.

All releasable information about GWEN has always been made available when requested. The Air Force has openly answered hundreds of Congressional, State, local, group and citizen inquiries on GWEN. Numerous town meetings and public hearings have been held, with both the Air Force and the DoD representative in attendance, to answer concerned citizens questions.

*Question.* Has s specific site been chosen for the Eugene, Oregon area? If so, where? If not, what sites are under consideration?

Answer. The prime site in Eugene, Oregon is still the sand and gravel pit in Lane County on County Farm Road.

*Question.* What is the timetable for commencement of construction of a tower in Eugene, Oregon?

Answer. Construction is scheduled for the summer of 1986.

*Question.* Has a specific site been chosen for the Klamath Falls, Oregon area? If so, where? If not, what sites are under consideration?

Answer. No. Several sites are under evaluation by RCA. In addition, rights-of-way for land evaluation are being obtained by the Army Corps of Engineers. Specific site locations will not be known to the government until RCA completes their evaluation.

*Question.* What is the timetable for completion of an EA or EIS for the Klamath Falls tower?

Answer. An Environmental Assessment (EA) is released about 30 days after prime site election.

*Question.* What is the timetable for commencement of construction of a tower in Klamath Falls?

Answer. Construction is scheduled for the October 1986 time frame.

*Question.* Has a decision been made about whether to build a tower in Portland, Oregon or Southern Washington area? If a tower is to be built there, when, and what sites are being considered?

Answer. There are no plans to build a GWEN relay node in Portland. Construction has been approved for a site in Appleton, WA. Actual construction of the relay node has not, as yet, been scheduled by RCA.

[Clerk's note.—End of questions submitted by Mr. AuCoin.]

Mr. Chappell. We will put the questions we have not covered in the record at this point and I have some to insert at this point.

[Clerk's note.—Questions submitted by Mr. Chappell and the answers thereto follow:]

## GRAMM-RUDMAN-HOLLINGS

*Question.* Provide details for the record as to the specific reductions made in $C^3$ as a result of the FY 1986 Gramm-Rudman-Hollings sequestration.

Answer. Although Gramm-Rudman-Hollings invoked across-the-board reductions, some flexibility was provided for defense in FY 1986. As a result, the following $C^3$ programs were exempted from reductions: E-6A, EA-6B, Mobile Subscriber Equipment (MSE), VH-60, Circuit Mayflower, Global Positioning System (GPS) multiyear, and Defense Satellite Communications System (DSCS) multiyear. The remaining $C^3$ programs were reduced from a low of the uniform 4.9% sequestration to a high of 9.5% for Defense Agencies' RDT&E in FY 1986.

### IMPACT OF SHUTTLE DELAY ON COMMUNICATIONS SATELLITES

*Question.* Provide for the record the present availability of ELVs (expendable launch vehicles) to launch DOD $C^3$ satellites.

Answer. All ELVs currently available for DOD $C^3$ satellites have been scheduled for various missions including $C^3$. The present inventory consists of:

3 Orbiters
6 TITAN 34Ds
3 ATLAS
10 CELVs

These vehicles are all committed to new or replenishment launches.

### ANTIJAM VOICE COMMUNICATIONS

*Question.* The antijam voice line item includes FY87 funding for the Have Quick II program. The Have Quick II program addresses secure and antijam UHF radio communications needs. This program is a follow-on, and is aimed at enhancing the antijam capability provided by the Have Quick program. The contractor for the Have Quick program will also be the contrator for Have Quick II.

The initial Have Quick program resulted in modifications to the ARC-164 radio and provided a quick, near-term solution to the jamming threat at that time. It is expected that the Have Quick II modifications will provide an antijam capability for the ARC-164 against the threat projected for the mid-1990's. Still further enhancements will be developed through a Have Quick IIa program. One improvement is aimed at achieving a hopping speed that is many times faster than the current capability. Other Have Quick IIa enhancements will include increased transmitter power and a time interface to the Global Positioning System. It is expected that the Have Quick II modifications will involve nearly 43,000 ARC-164 radios (36,500 airborne radios) and cost over $500 million.

The anticipated follow-on to the Have Quick II program had been the Enhanced JTIDS System (EJS). This would have been a new radio replacing the ARC-164's. However, according to Air Force budgetary documents and program officials, that program will be terminated and a new program—Modular Integrated Communication Navigation Identification Avionics (MICNIA)—will evolve and may implement the EJS technology into future in-production aircraft, e.g., the F-16 and the Advance Tactical Fighter.

How has the jamming threat changed making the original Have Quick modification obsolete?

Answer: The jamming threat has always been and will continue to be evolutionary and reactive. As countermeasures to a jamming threat are developed, the jamming threat will itself be improved by the enemy, usually to defeat the newest countermeasures which have been introduced. Thus, the Have Quick radio system is continuously evaluated in terms of its vulnerability to new reactive threats. Have Quick II and IIA are evolutionary improvements to Have Quick specifically designed to prolong the effectiveness of that radio as more challenging threats emerge.

*Question.* How many airborne and ground ARC-154 radios are in the Air Force inventory and how many of these radios have the Have Quick capabilities?

Answer: There are approximately 25,000 ARC-164 radios in the Air Force inventory. Approximately 11,000 of these radios have already been modified for Have Quick.

*Question.* What other avionics systems must be re-engineered to accommodate the Have Quick II and Have Quick IIA modifications.

Answer: No changes on other fighter aircraft avionics systems have been precipitated by HQ II and HQ IIA. In some command and control platforms, such as the E-3A, new radio frequency filtering techniques were developed to eliminate mutual interference problems between multiple radios. In addition to the AN/ARC-164, Have Quick modifications have been or will be developed for the AN/ARC-171, AN/ARC-182, AN/GRC-171, AN/WSC-3 and Pacer Speak radios. In addition, some of our allies are modifying inventory radios for Have Quick. It is anticipated that all of these radios will be upgraded to Have Quick II and, perhaps, to Have Quick IIA.

*Question.* Why was the EJS program terminated? What effect does the termination of the EJS program have on the Air Force requirement for an anti-jam voice communications capability using UHF radios?

Answer. The EJS program was terminated as a result of weighing the system cost against the emerging threat also taking into account existing budget constraints. It is currently the DoD position that the Have Quick IIA improvement represents a more cost effective solution for high anti-jam voice communications than EJS at least through the early part of the next decade. The basic requirement remains to be able to communicate by voice between aircraft and between aircraft and the ground in the presence of enemy jamming.

*Question.* How will the Air Force use the nearly $66 million in FY86 RDT&E appropriations since the EJS has been terminated.

Answer. It is our intention to use these funds for EJS (through program termination), and for unfunded requirements principally in the Have Quick, SINCGARS, ICNIA and JTIDS programs. It is expected that several of these reprogramming actions will require Congressional approval.

*Question.* What are the distinctions between the Seek Talk, EJS, and the new MICNIA program?

Answer. Seek Talk and its successor EJS were both designed as high anti-jam voice radios. ICNIA is a concept, currently in advanced development, whereby a number of communications, navigation and identification (CNI) functions, of which anti-jam voice communications is one, are all performed in an integrated fashion.

MICNIA (or modular ICNIA) is a term formerly used for ICNIA terminals built up from a set of common line replaceable modules. All ICNIA terminals will be modular. Terminals produced for various aircraft will be simply sets of ICNIA hardware modules tailored to the requirements of a specific platform. This concept seeks to exploit the systems approach in designing CNI avionics for tactical aircraft.

*Question.* What is the cost and schedule profile for MICNIA? Under which program element will it be identified?

Answer. MICNIA is the former term for a modular implementation of the ICNIA concept for specific platforms. At the present time, studies are being conducted under the ICNIA program to identify candidate ICNIA configurations (i.e. which functions for which platforms) for implementation in the Full Scale Engineering Development program which is scheduled to commence in FY88. All ICNIA funding is currently in the INEWS/ICNIA program element (P.E. 63109F). ICNIA Full Scale Development funding will be included in the Integrated EW/CNI program element (P.E. 64250F) as a new start in the FY 1988 President's Budget.

## ARMY COMMAND AND CONTROL SYSTEM [ACCS]

*Question.* This committee has long been supportive of Army's efforts to upgrade the command and control of its fielded units as well as Army's intent to maximize commonality between the various $C^3$ programs. We supported Army's plans for standardization of computer hardware in the Military Computer Family (MCF), only to learn from the GAO that Army had terminated the program on its own. The (MCF) program was to provide standard computers and operating systems software that would be used on all new $C^3$ programs and software developments. Whereas that plan was logical and supportable, Army's current ACCS plan is not so well conceived.

Army has been struggling for the last two years just to define the ACCS requirements, and to find a basis for agreement within Army. Meanwhile, the respective $C^3$ programs have moved forward despite an undefined and unapproved ACCS program, while hundreds of millions of dollars have been expended. The Army is basing the acquisition of critical $C^3$ programs upon the highly risky ACCS program. As a consequence, all related $C^3$ programs dependent on ACCS hardware face serious uncertainties and substantial cost and schedule slips.

As you know, the ACCS program is not complying with DOD acquisition directives, has only limited developmental and operational testing scheduled, and has had no ASARC/DSARC reviews. The entire ACCS Plan is dependent on a yet unproven and highly risky, "software transportability" concept. Unlike the (MCF) program which established a hardware baseline, under the ACCS concept Army is to develop the software first and then select hardware at some later date with the expectancy that the software will operate properly in the chosen ACCS architecture.

There is general agreement that the current ACCS effort, which is RDT&E only, should be continued with emphasis on achieving interoperability between systems, and maximum use of Non-Developmental Items (NDI) to reduce fielding times and costs. However, the Army's concept for a universal and standardized computer architecture became suspect when Army terminated the MCF family. Attempting to resurrect that approach at this time seems not only too little and too late, but it impedes our efforts to meet the critical $C^3$ needs facing the Army. We encourage you to review the Army's overall $C^3$ plans with a view toward placing greater emphasis on utilizing existing systems and equipments and establishing objective cost/benefit/risk relationships of mandating common but, as yet, unapproved and undeveloped hardware for future Army $C^3$ programs at this time.

Mr. Secretary, we would appreciate your comments for the record.

Answer. I am pleased to provide some comments on the Army's efforts to provide coherent, interoperable, and synchronized fielding plan for its battlefield command and control systems. As your question indicates, there has been a lengthy struggle to achieve these objectives, with many unsuccessful past chapters. However, this problem of limiting the proliferation of hardware and software, while trying to come to grips with the diverse requirements of the various military functions, has been experienced by all DoD components.

The Military Computer Family (MCF) program addressed a subset of the overall ACCS problem and attempted to solve the hardware proliferation problem by standardizing on a single family of machines and an instruction set architecture. The Army discovered that there were disadvantages and constraints to every strategy it tried and ultimately decided to cancel the program over our (OSD's) objections.

By forcing the issues to light, the MCF cancellation and the effort to install Ada as a DoD language standard have forced the Army to seriously address its commonality and interoperability problems. This in turn advanced the conceptual process which has led to the principles which underlie the ACCS program.

As an umbrella system, the ACCS concept includes all five of the tactical $C^3$I systems previously identified as the Sigma Star including the supporting communications systems. ACCS is primarily intended to serve the roles of providing interface specifications, establishing common and/or interoperable hardware and software, maximizing use of common software modules, and forcing synchronized fielding. It is also intended to obtain economies of scale in the procurement of hardware and in fostering the use of NDI (non developmental item) hardware and software. Essential to the concept are software standards—such as data dictionaries, communications formats and protocols, common or integrated data bases, software programming languages, tools, and modules.

There has been some concern expressed with the risk associated with Ada software transportability. We feel that this risk is relatively low. This assessment is based on the great deal of DoD and industry experience with compilers and standard languages other than Ada that are transportable. Ada's primary new advantage is in the discipline inherent in the coding process. Many compilers are already in their second generation and their efficiency is reasonably good and improving. In fact, there are some thirty existing Ada compilers.

The majority of cost for most C2 systems is for software development and life cycle maintenance of both hardware and software. Therefore, if we are going to reduce the overall cost of C2 systems, the strategy must focus on the software and common hardware. The Army's strategy of software first on common hardware is the right strategy to achieve this goal.

The ACCS concept is driven by long recognized deficiencies, and a generally lackluster outcome from highly differentiated effort on individual elements of both Sigma Star and its Combat Service Support subsystem. We acknowledge that this concept is complex and a challenge to implement. It will take time to make all of the changes in management, acquisition and funding methodology which are necessary to accomplish our goals. ACCS is a significantly improved approach to solving the Army's problems, and needs your wholehearted support. The alternative is to remain with the disjointed, costly methods of the past.

Be assured that we will continue to review and influence the evolving ACCS management structure. Hopefully, the emphasis is fielding systems with good software, hardware, etc., which satisfies requirements and achieves objective cost/benefit/risk relationships which are prudent and appropriate for both the Army and the Department of Defense.

### SHORT RANGE AIR DEFENSE PROGRAM (SHORAD)

*Question.* Secretary Latham, Army has been attempting to initiate the Short Range Air Defense (SHORAD) for almost five years now. The Program has recently been made a part of the Foward Area Air Defense System (FAADS). This committee has been and continues to be supportive of this urgent requirement, but does not support Army's program FAAD C² acquisition strategy based upon ACCS hardware. Army plans to ask the competing FAAD C² contractors to submit proposals without knowledge of the yet-to-be-selected weapons system, sensors, or even the computer hardware and its associated software. The latter, of course, is dependent on the unapproved and risky ACCS program. As you well know, the complexities of C² developments will be multiplied dramatically when they introduce the uncertainties facing the potential FAAD C² contractors in addition to the resulting impacts on the costs and schedule for this critical program.

Mr. Secretary, this Committee has serious reservations about the lack of progress and the direction the SHORAD/FAAD C² program seems to have taken. We would be interested in your comments on the program and recommend that you take early action to place the program on a more secure and stable basis. Please comment.

Answer. Progress in the Army has been slow. An Army System Acquisition Review Committee (ASARC) review was conducted in 4Q85. The Department of Defense System Acquisition Review Committee (DSARC) has been postponed by the Army until July of 86 in order to integrate the SHORAD Command and Control (C²) program into the total Forward Area Air Defense (FAAD) architecture. The FAAD architecture was briefed to the Secretary of Defense in January of 86 and it has been approved in principle. We have done and will continue to do everything in our power to speed the process.

*Question.* How can competing contractors submit proposals with any realistic cost, schedule and performance information with most of all of the critical interfaces unknown or undetermined?

Answer. FAAD $C^2$ system interfaces have been defined generically and documented. The detailed interface specifications are the responsibility of the FAAD $C^2$ contractor. Each weapon system or sensor contractor will be required to meet these specifications. Since the information which can be distributed is well defined and limited to a few data items and the hardware interface will be Government furnished, this task is considered to be reasonable.

*Question.* Are there any interim solutions based on non-developmental items (NDI) hardware and software which might meet near term urgent requirements?

Answer. Yes; and that is precisely the Army's approach. They plan on using NDI hardware coupled with a 3 year software development and integration effort that results in expeditious fielding.

*Question.* What is the schedule; contractual, developmental, testing and production for FAAD $C^2$ portion of FAADS?

Answer. The Army plans to award the FAAD $C^2$ systems integration contract for system design and software development following a FAAD DSARC scheduled for July 86. The Army hopes to receive permission to develop Air Defense application software, initially on ACCS surrogate hardware, and to integrate with ACCS hardware. This will be followed by a system test in FY89. A second software build is planned for the integration of common ACCS software modules. Testing of the full objective system is scheduled for FY90. The Army plans to begin a limited buy of NDI hardware such as ACCS computers and displays, generators, communications and trucks in FY 1988 to support the development and testing.

Of course, their plans are only tentative and subject to DSARC review and approval.

*Question.* How does the potential or likely programmatic uncertainties of the ACCS program affect this schedule?

Answer. Delays in availability of ACCS hardware will adversely affect the program. Delays in availability of common software will delay the fielding of the non Air Defense applications which are required for a complete FAAD system. In short, success of ACCS is very important to the FAAD development.

*Question.* Have the risks of the ACCS hardware dependency and software transportability been fully considered?

Answer. Yes, We believe that the benefits of using common hardware on interoperability and supportability outweigh the risks that ACCS hardware will be available on schedule. Development of software for Air Defense applications might begin on ACCS commerical hardware if the contractor is selected as scheduled. Surrogate hardware that meets the ACCS requirements could be used to begin initial software development if the schedule slips. The software will be developed using the Ada high order language (HOL). Our indications are that we can expect a high degree of transportability using Ada based on industry analyses and experience with other HOL's.

*Question.* The Army is asking for more than $200M for this software only effort. Is it possible to achieve an acceptable near-term capability at lower costs and with less risk?

Answer. The Army's program has been laid out to minimize the risks and field on as rapid a schedule that can be considered prudent. We feel that the software development task has been properly sized and resourced against the requirement. We do not feel that a partial solution can be fielded early enough to be cost effective.

[CLERK'S NOTE.—End of questions submitted by Mr. Chappell.]

Mr. **CHAPPEL.** Mr. Latham, you have done your usual outstanding job and the committee is especially proud of the usually fine work that you do. You have been most helpful in this briefing as you have been in all the briefings we have had and the committee thanks you.

Thank you very much, Mr. Latham.

The committee will stand ajourned until 1:30.

WEDNESDAY, APRIL 16, 1986.

# DEFENSE COMMUNICATIONS AGENCY (DCA), COMMUNICATIONS, COMMAND AND CONTROL

## WITNESS

LT. GEN. WINSTON D. POWERS, USAF, DIRECTOR, DEFENSE COMMUNICATIONS AGENCY

## INTRODUCTION

Mr. CHAPPELL (presiding). The committee will please come to order.

This afternoon the committee will resume its hearings on the command, control and communications programs of the Department of Defense.

This morning we heard a $C^3$ overview from Secretary Latham. This afternoon we will take in turn the Defense Communications Agency and then the Army, Navy, and Air Force.

Our time is extremely limited this afternoon; we will ask each witness to summarize his statement in ten minutes, and we will follow with a brief question and answer period.

The Defense Communications Agency overview statement on command, control and communications programs will be presented by Lieutenant General Winston D. Powers, Director, Defense Communications Agency.

General Powers, your entire statement will be placed in the record. Please proceed.

## SUMMARY STATEMENT OF GENERAL POWERS

General POWERS. Mr. Chairman, it is my pleasure to appear before the committee once again to explain the DCA budget for the Defense Communications System, and in my role as manager of the National Communications System, to present that portion of the program also.

The Defense Communications System, as you realize, is that system that provides an umbilical cord for the major command and control systems such as AUTOVON, AUTODIN, AUTOSEVCOM, support to the National Command Center; architectural work for the Unified Specified Commands; ADP work for the Joint Chiefs of Staff and OSD, and the principal architecture for bringing on new systems to replace the aging switch systems we have now in being.

We also provide communications support to the White House through the White House Communications Agency. That concludes my brief opening remarks. I am at your pleasure to answer any questions, sir.

[The statement of General Powers follows:]

## Prepared Statement Submitted by Lieutenant General Winston D. Powers, USAF, Director, Defense Communications Agency (DCA)

### INTRODUCTION

Mr. Chairman and members of the Subcommittee: I am Lieutenant General Winston D. Powers, Director of the Defense Communications Agency (DCA) and Manager of the National Communications System (NCS). I appreciate this opportunity to appear before you today to discuss our FY 1987 budget request and the contributions we make in providing the Department of Defense (DoD) with modern, endurable, and survivable Command, Control, and Communications ($C^3$) systems.

The Defense Communications Agency's FY 1987 $C^3$ budget request reflects an adjustment of our goals, workload, and resources in response to a rapidly evolving $C^3$ environment and the recognition of $C^3$ as a critical top priority mission. The shift in national, strategic and theater policy objectives, the introduction of major new weapon systems and employment concepts, the increased $C^3$ activity associated with various Commanders in Chief (CINC), and the rapidly changing commercial environment are all major factors adding to the job which we must accomplish.

### DCA $C^3$ MISSIONS AND PROGRAMS

Today, DCA is the DoD focal point for strategic $C^3$ work in support of the forces. Our $C^3$ mission encompasses five basic functional areas; $C^3$ Architecture, Planning, Engineering, and Integration; Joint Data Systems Support; Defense Communications System Management and Engineering; National Communications System (NCS) Management and Engineering; and White House Communications Support.

(1) $C^3$ Architecture, Planning, Engineering, and Integration:

This function is a three-part mission. It provides centralized planning, engineering, test and evaluation to help ensure an orderly and efficient integration of DoD Strategic Systems. Programs supported include the National Military Command System (NMCS), Worldwide Military Command and Control Systems (WWMCCS) Engineering, the Minimum Essential Emergency Communications Network (MEECN), and Military Satellite Communication (MILSATCOM) Systems.

The NMCS-wide program provides system engineering and technical support to the NMCS, the primary component of the WWMCCS, which is designed to meet command and control requirements of the National Command Authorities (NCA) and the Joint Chiefs of Staff (JCS). The NMCS provides the NCA with information concerning military posture, readiness, and activities in all environments from peacetime to crisis management and nuclear war. Four projects are supported; NMCS System Engineering; NMCS Command Center Engineering; NMCS Warning/Information System Engineering; and WWMCCS/NMCS Exercise and Evaluation. This program also provides engineering support to a classified program.

WWMCCS System Engineering was established to achieve new WWMCCS capabilities with major improvements. To effect these improvements, the Defense Communications Agency (DCA) was given the responsibility for overall program integration. DCA technically guides, monitors, assists, and advises the responsible components, OJCS, OSD and other concerned DoD components on command, control, and communications ($C^3$) matters. This program provides systems engineering analysis and engineering support for the WWMCCS community. It also documents and analyzes changes to provide system integration analysis of WWMCCS projects.

Minimum Essential Emergency Communication Network (MEECN) provides system engineering, planning, development, test and evaluation, and other technical support for the MEECN, and supports planning, engineering, and testing of the overall Strategic Connectivity Network. Functions supported include Attack

Warning/Attack Assessment, Conferencing, Emergency Action Message Dissemination, and Force Management.

DCA is the system architect for DoD Military Satellite Communications (MILSATCOM) Systems. The objective of the MILSATCOM Systems effort is to provide a single coordinated approach to the planning, development, acquisition, and operational deployment of reliable, secure, survivable and cost-effective satellite communications to meet the needs of the DoD and state and national level authorities. This coordinated approach promotes the achievement of maximum interoperability and compatibility among military satellite communications systems, as well as with other military and commercial communications systems.

DCA works in close coordination with the Organization of the Joint Chiefs of Staff (JCS), the Military Departments, Unified and Specified Commands, and other DoD organizations to ensure $C^3$ architectures, plans, and system specifications provide for capabilities responsive to the needs of $C^3$ system users.

(2) Joint Data Systems Support:

This mission provides technical ADP and analytical support to the Organization of the Joint Chiefs of Staff (OJCS), the Office of the Secretary of Defense (OSD), and to the WWMCCS ADP community. It consists of three programs: Worldwide Military Command and Control System (WWMCCS) ADP support; National Military Command System (NMCS) ADP support; and WWMCCS Information System (WIS) Support.

Under the WWMCCS ADP program, DCA provides ADP centralized technical management of the WWMCCS ADP standard system software distributed to WWMCCS ADP sites worldwide. Centralized technical management includes support in the areas of software development, enhancement, and integration, quality assurance, and configuration management. Software development, enhancement, and integration produces new software capabilities in response to OJCS validated requirements; corrects existing system discrepancies and malfunctions, and integrates these into the operational system. Quality assurance maximizes the benefit users derive from the software through a series of comprehensive tests and evaluations of current standard system software prior to shipment to the user community.

Configuration management provides procedures for accounting for all software elements of the system, and monitors changes in these elements resulting from OJCS validated requirements.

In the NMCS ADP program, DCA provides day-to-day ADP, analytical, and computer operations support to the NMCS, OJCS, and OSD in meeting new information requirements in a changing political and military environment. Information processing and other computer applications software capabilities are provided to the OJCS and WWMCCS ADP community in order to be more responsive to command and control decision processes. Included are efforts in the areas of tactical warning, exercise planning and evaluation, force status, strategic operations, and logistic and mobility planning. We develop, distribute, and maintain 20 WWMCCS standard application software systems. Analytical and day-to-day operational support to OJCS and OSD is provided in the areas of operational forces planning and execution, logistic studies, negotiations, wargaming, exercises, damage assessment, tactical waring, and vulnerability analysis and recovery.

The WWMCCS Information System (WIS) is the planned evolutionary improvement of the existing WWMCCS ADP baseline. In support of the WIS, DCA thoroughly investigates the potential applications of ADP capabilities to permit informed decisions on requirements which will influence the evolution of the WIS. DCA develops and implements prototype ADP capabilities or systems for the WIS Joint Program Manager, and evaluates their effectiveness.

Continuing support in all areas of the WWMCCS ADP system, as previously discussed, is being provided during the transition to WIS.

(3) Defense Communications System (DCS) Management and Engineering:

This mission is dedicated to the modernization and effective operation of the global Defense Communication System (DCS). The DCS is the primary communications system which supports the JCS, CINCs, and Military Department $C^3$ requirements worldwide. DCA provides engineering, operational direction, and management control of the DCS. This support is provided by an engineering center, an operations center and DCA Field Activities located in Europe, the Pacific, and at MacDill AFB, Florida.

Major communication systems supported include the worldwide Automatic Voice Network (AUTOVON) - and its replacement system the Defense Switched Network (DSN); the Automatic Data Network (AUTODIN) - and its replacements the Inter-Service/Agency Automatic Message Processing Equipment (I-S/A AMPE) and the Defense Data Network (DDN); the Automatic Secure Voice Network (AUTOSEVOCOM) - and its replacement the Secure Voice Improvement Program (SVIP); the Defense Satellite Communications System (DSCS); and the Jam Resistant Secure Communications (JRSC) Program.

DCA has taken the lead to transition DoD standards from the analog to the digital world and is working closely with the Joint Tactical Command, Control and Communications Agency (JTC3A) to develop common long-haul and tactical standards to ensure interoperability. DCA is also participating with international standards groups to favorably influence from a DoD perspective standards they develop.

DCA also provides for the installation, maintenance, and support of all communications in the portion of the DCS used in intelligence and warning, and for command, control and administrative/logistic support of the Unified and Specified commanders under both peacetime and wartime conditions.

(4) National Communications System (NCS) Management and Engineering:

As the Director of the DCA, I have separate and distinct responsibilities as Manager of the National Communications System (NCS). The NCS was established by Executive Order 124723 of 3 April 1984. It is composed of the telcommunications assets of 22 Federal entities which have been designated by the President; and an administrative structure which consists of an Executive Agent (the Secretary of Defense); the NCS Committee of Principals (representatives of the 22 NCS members); and the Manager, (myself).

The Executive Order assigns the NCS the mission of assisting the President, the National Security Council, the Office of Science and Technology Policy, and the Office of Management and Budget, in exercising their wartime and non-wartime telecommunications functions and responsibilities, and the coordinating of the planning for and provision of national security and emergency preparedness telecommunications for the Federal government under all circumstances including crisis and emergency, attack, recovery, and reconstitution.

There are several National Security Decision Directives which provide additional guidance to the NCS. Specifically, National Security Decision Directive 97 requires that initiatives be developed which will improve the survivability and restorability of the commercial telecommunications system that support national security requirements, enhance the survivability and endurability of U. S. commerical satellite, and provide commercial satellites, and provide communications support for Government agencies which have responsibilities for continuation of government functions during all phases of conflict.

As the Manager of the NCS, I am assigned the responsibility for developing programs which will accomplish the NCS mission, and implement the provisions of the National Security Decision Directives, and submit them for consideration by the Committee of Principals and the Executive Agent.

(5) White House Communications Support:

The Defense Communications Agency provides worldwide communications support to the President, Vice President, key White House personnel and Secret Service protective elements through the White House Communications Agency (WHCA).

## DCA C$^3$ GOALS AND OBJECTIVES

Our primary goal is to provide the secure, survivable, endurable, and interoperable C$^3$ systems needed to maximize the performance of our forces and weapons systems. In pursuit of this goal, our overriding objectives are to:

- Make improvements in the quality, reliability, and cost effectiveness of Strategic C$^3$ Systems, with particular attention focused on increasing the capacity, survivability, assured connectivity, and endurance of WWMCCS, the NMCS, and the MEECN.

- Provide system engineering and technical support for the WWMCCS.

- Provide necessary C$^3$ architecture development, planning, and system integration for DoD-wide C$^3$ programs, including Military Satellite Communications.

- Provide analytical and automated data processing support to the Joint Chiefs of Staff, the office of the Secretary of Defense, and other DoD components.

- Emphasize survivable, secure, jam-resistant, and interoperable common user voice and data communications systems for the global Defense Communications System. Three major improvements in this area currently underway are the implementation of the Defense Switched Network (DSN) and the Defense Data Network (DDN), and improvements to the Defense Satellite Communications System (DSCS); including the development of a Universal Modem.

- Provide worldwide communications support for the President.

- Develop initiatives to improve the survivability and restorability of commercial telecommunications systems that support national security requirements associated with the National Communications System (NCS).

- Procure leased communications circuits, services, facilities, and equipment for DoD and other Government agencies as directed by the Secretary of Defense.

In recent years, our responsibility for meeting these goals and objectives has increased considerably, primarily due to the Administration's emphasis on providing an endurable and survivable C$^3$ systems capability. As you might imagine, this emphasis has had a direct impact on DCA's C$^3$ mission, and it is reflected in our FY 1987 C$^3$ budget.

Accordingly, our FY 1987 request provides for a continuation of C$^3$ improvements to defense and national communication programs that began in 1981.

## DCA C$^3$ BUDGET SUMMARY

Our C$^3$ budget request for FY 1987 provides the necessary resources to fulfill our goals and reflects our plans for attaining our objectives. For FY 1987 we are requesting $495.4 Million in four appropriations:

FY 1987
($ in Millions)

| RDT&E | O&M | PROCUREMENT | MILITARY CONSTRUCTION |
|---|---|---|---|
| $119.3 | $311.2 | $55.0 | $9.9 |

To help achieve a better overview and integration of the various $C^3$ systems, the Department of Defense (DoD) manages total DoD $C^3$ system resources by using a mission area structure. Each mission area consists of a group of programs and associated resources mutually dedicated to addressing specific $C^3$ objectives. DCA's FY 1987 $C^3$ budget supports the following DoD mission areas.

TOA in Millions

| MISSION AREA | DCA FY 1987 BUDGET |
|---|---|
| Strategic $C^3$ | $ 94.9 |
| Theater and Tactical $C^3$ | 4.3 |
| Defense-Wide $C^3$ | 363.7 |
| Management Headquarters | 32.5 |
| TOTAL | $495.4 |

The overview charts at the end of this statement portray DCA's overall $C^3$ budget by individual appropriations and $C^3$ mission areas.

## DCA $C^3$ MISSION AREA OVERVIEWS

The following mission area overviews briefly highlight DCA $C^3$ programs requested in our FY 1987 budget:

### 1. STRATEGIC $C^3$ PROGRAMS

Strategic $C^3$ programs provide the means to link widely dispersed strategic units into an integrated, effective force. They provide important fundamental $C^3$ capabilities such as command decision making and strategic communications connectivity.

For Strategic $C^3$ programs in FY 1987, we are requesting $94.9 Million. This represents about 19.2% of our total FY 1987 budget request. Programs funded in this area include NMCS-Wide Support; WWMCCS System Engineering; MEECN; and a classified program called Island Sun.

|  | FY 1987 ($ in Millions) |  |  |  |
|---|---|---|---|---|
|  | RDT&E | PROC | O&M | TOTAL |
| A. NMCS-WIDE SUPPORT: | 10.5 | 3.7 | 6.0 | 20.2 |

DCA is responsible for providing system engineering and technical support for the National Military Command System (NMCS), the major component of the Worldwide Military Command and Control System (WWMCCS). The NMCS is designed to meet the command and control requirements of the National Command Authorities (NCA) and of the Joint Chiefs of Staff (JCS), and to provide them with critical information concerning military posture, readiness and activities ranging from normal day-to-day operations to nuclear war.

The NMCS consists of the National Military Command Center (NMCC), the Alternate National Military Command Center (ANMCC); the National Emergency Airborne Command Post (NEACP); and the facilities, communications systems, information processing equipment, and decision support aids interconnecting these command centers and the NCA.

The primary focus of this program in FY 1987 is to continue efforts to provide compatible, interoperable, and balanced NMCS in all operational environments. DCA's efforts include requirements definition, concept development, technical analysis, system integration and engineering, and operation and maintenance support for new DoD command and control capabilities.

| | FY 1987<br>($ in Millions) | | | |
|---|---|---|---|---|
| | RDT&E | PROC | O&M | TOTAL |
| B. WWMCCS SYSTEM ENGINEERING: | 19.3 | - | 12.3 | 31.6 |

The function of the Worldwide Military Command and Control System (WWMCCS) System Engineer is to provide the systems engineering necessary for a reliable and responsive WWMCCS to support the National Command Authorities and top level military commanders.

As the WWMCCS System Engineer, DCA manages the architectural evolution of the WWMCCS and supporting systems by identifying and assessing the capabilities needed to achieve a balanced and effective WWMCCS.

The scope of these efforts has expanded over the years to provide broader and more comprehensive technical and planning guidance on the full range of related matters. In this role, DCA will continue to guide the implementation of near-term improvements and plan the future improvements necessary for effective and survivable Command, Control and Communications Systems.

The primary focus of this program in FY 1987 is to continue the development of $C^3$ architectures and plans, and provide technical support to ensure the coherent and integrated development of $C^3$ systems from the point of view of overall national policy, joint operations objectives, projected threats, technological projections, affordability, and interoperability. Efforts in this area will enhance the operational effectiveness of command centers, improve communications connectivity, and provide for the interoperability and compatibility among Military Satellite Communications Systems.

| | FY 1987<br>($ in Millions) | | | |
|---|---|---|---|---|
| | RDT&E | PROC | O&M | TOTAL |
| C. MEECN: | 11.3 | - | - | 11.3 |

DCA has the responsibility of ensuring integrated operation, system responsiveness, and future development of the multiple communication assets comprising the Minimum Essential Emergency Communications Network (MEECN). Funds requested in FY 1987 will provide for strategic $C^3$ connectivity engineering and architectural development of the total $C^3$ network, including Attack Warning/Attack Assessment, conferencing support, Emergency Action Message dissemination (supported by the MEECN) and Force Management/Report-Back.

In FY 1987 the strategic connectivity engineering efforts will continue to focus on the analysis and evaluation of the strategic networks in the areas of connectivity, performance capabilities, reliability, survivability, and deficiencies in simulated environments. A comprehensive test and evaluation program will be conducted to ensure that $C^3$ systems and procedures meet planned performance and capability objectives.

Also in FY 1987, strategic connectivity architecture and planning efforts will continue to provide modeling and planning for endurable two-way connectivity among critical elements of the National Military Command System (NMCS) and the Unified and Specified Commanders-in-Chief (CINCs).

| | FY 1987 | | | |
|---|---|---|---|---|
| | ($ in Millions) | | | |
| | RDT&E | PROC | O&M | TOTAL |
| D. ISLAND SUN: | 31.8 | - | - | 31.8 |

Information on this classified program and justification of estimates has been provided to the Subcommittee through appropriate channels.

2. THEATER AND TACTICAL $C^3$ PROGRAMS

Theater and Tactical $C^3$ programs are essential to military commanders for planning, directing, controlling, and operating their forces in a hostile environment. DCA has two on-going RDT&E programs in this area, (1) Commanders in Chief (CINC) Command and Control ($C^2$) Initiatives, and (2) the Command and Control Research Program.

We are requesting $4.3 Millions in FY 1987 for these programs.

| | FY 1987 | | | |
|---|---|---|---|---|
| | ($ in Millions) | | | |
| | RDT&E | PROC | O&M | TOTAL |
| A. CINC $C^2$ INITIATIVES: | 2.2 | - | - | 2.2 |

The CINC $C^2$ Initiative program was established in 1979 and DCA was designated as the financial manager for the program in 1980.

This program provides the CINCs with the capability to enhance their command and control systems with low-cost, quickly implemented improvements. It also allows the CINCs to improve their near-term $C^3$ capabilities and perform RDT&E efforts to meet their theater and tactical $C^3$ needs of the future.

FY 1987 efforts will continue to support research and development efforts for highly reliable, secure communications for rapid deployment in support of crisis operations; for improved connectivity between US and allied communications; and for enhancements and refinements to crisis management capabilities and command centers to adapt existing, and to evolve new command and control systems to meet unique requirements of the CINCs.

| | FY 1987 | | | |
|---|---|---|---|---|
| | ($ in Millions) | | | |
| | RDT&E | PROC | O&M | TOTAL |
| B. $C^2$ RESEARCH PROGRAM: | 2.1 | - | - | 2.1 |

This program provides broad-based, interdisciplinary research leading to a better understanding and theoretical basis for command and control ($C^2$) associated with joint and combined operations. The objective of the program is to fulfill a longstanding need for basic research into military $C^2$ by investigating emerging technologies, methodologies, and developing theories of military $C^2$. The fiscal year 1987 budget request of $2.1 Million will continue the theoretical and applied research necessary to develop $C^2$ as an intellectual discipline and science and contribute to the resolution of interoperability problems of military $C^2$.

3. DEFENSE-WIDE $C^3$ PROGRAMS

Defense-wide programs provide $C^3$ systems capability for strategic information processing and display systems, long-haul communications operations, and defense-wide communications necessary to communicate between national and theater command and control elements.

For Defense-Wide $C^3$ programs in FY 1987, we are requesting $363.7 Million. This represents about 74% of our total FY 1987 budget request. Our Defense-Wide $C^3$ programs include WWMCCS ADP, WIS, Long-Haul Communications DCS, and the NCS.

| | FY 1987 ($ in Millions) | | | |
|---|---|---|---|---|
| | RDT&E | PROC | O&M | TOTAL |
| A. WWMCCS ADP: | - | .4 | 27.4 | 27.8 |

In FY 1987, the WWMCCS ADP program will continue to provide support for the central maintenance and management of standard WWMCCS ADP systems software used by DoD command centers worldwide. This program procures new ADP equipment for a central test facility; provides WWMCCS ADP software upgrades; and provides software support and integration, quality assurance, configuration management, and system software improvements for WWMCCS sites.

Through these efforts, DCA corrects current system discrepancies and integrates newly developed software into the standard operating systems. We conduct comprehensive tests and evaluations of the current system.

We also provide central configuration management in which we account for all elements of WWMCCS computer system software and monitor changes in these elements.

DCA provides and operates a central test facility which also acts as an emergency backup node of the WWMCCS Intercomputer Network.

| | FY 1987 ($ in Millions) | | | | |
|---|---|---|---|---|---|
| | RDT&E | PROC | O&M | MILCON | TOTAL |
| B. WWMCCS ADP-NMCS: | - | 2.8 | 54.8 | 2.3 | 59.9 |

The NMCS portion of the WWMCCS provides priority support to the National Command Authority (NCA) from three major command centers: the National Military Command Center (NMCC); the Alternate NMCC (ANMCC); and the National Emergency Airborn Command Post (NEACP). This support includes operating large ADP facilities at three sites in the Pentagon and at the ANMCC, computer programming and analytical support to the OJCS and OSD development of data-bases to support OJCS studies and analysis, and development and maintenance of applications software used by WWMCCS sites worldwide.

In FY 1987, we will continue to provide day-to-day ADP, analytical, computer operations services, and ADP upgrades for those command centers. To meet new requirements in changing political and military environments, this program also improves analytical and information processing capabilities, for the OJCS and OSD, to be more responsive to command and control decision processes. Increased effort in the areas of tactical warning, exercise preparation and evaluation, force status, strategic operations, and logistic and mobility planning will be pursued.

In addition, we are requesting Military Construction (MILCON) funds for this program in FY 1987 to provide for the alteration and expansion of our office space at the Pentagon to accommodate increased mission requirements.

| | FY 1987 ($ in Millions) | | | |
|---|---|---|---|---|
| | RDT&E | PROC | O&M | TOTAL |
| C. WWMCCS INFORMATION SYSTEM (WIS): | - | 11.7 | 13.9 | 25.6 |

The WIS is DoD's modernization program for WWMCCS ADP hardware and software.

For the WIS program in FY 1987, a full range of test, evaluation, and enhancement services is required to integrate the WIS Common User Subsystem and Joint Mission software and hardware into the operational WWMCCS environment.

New computer hardware for the WIS necessitates funding for hardware and software maintenance, system analyst support, hardware and software security, and computer operations. Funding is also required for development and testing efforts which are underway to support WIS interfaces and new WIS ADP equipment. Increased services will be provided to OJCS and OSD customers in the areas of tactical warning, exercise preparation and evaluation, force status, operational logistic and mobility planning; and the implementation of applications software conversions to the new WIS hardware.

FY 1987, funds will also provide for the procurement of ADP equipment and upgrades for the NMCC, the ANMCC, and WIS equipment for the Operational Support Facility (OSF).

| | FY 1987 ($ in Millions) | | | |
|---|---|---|---|---|
| | RDT&E | PROC | O&M | TOTAL |
| D. LONG-HAUL COMMUNICATIONS DCS: | 39.1 | 28.8 | 113.1 | 181.0 |

DCA is responsible for the system development, overall planning, implementation management, and operational direction of the Defense Communications System (DCS). The DCS is the single defense-wide common user communications system for the Department of Defense (DoD) and core of DoD non-tactical communications. It provides connectivity between the National Command Authorities (NCA), Unified and Specified Commands, theater commands and the supporting commands assigned to the operational forces. FY 1987 efforts under this program will continue to make improvements in the endurability, survivability, security, and responsiveness of the DCS, while also improving system cost-effectiveness.

To improve the capabilities of the DCS, we are continuing in FY 1987 to pursue major improvements to the Defense Switched Network (DSN) and the Defense Data Network (DDN).

The DSN is DoD's next generation, long-distance telephone service. Phase I of the DSN will be fully operational by FY 1987 and will provide telephone, data, video services in portions of the Western Hemisphere. We are continuing to acquire, install and test digital transmission equipment worldwide. By exploiting the Public Switched Network and procuring commercially available technology, the FY 1987 program will continue to progress toward its goal of replacing the Automatic Voice Network (AUTOVON).

The DDN is the common-user, long-haul digital communications system which supports all DoD data transmission requirements worldwide. The DDN is being expanded to accommodate new subscribers. The classified and unclassified networks in the DDN program have been enhanced and expanded for reliability, survivability and maximum availability. The classified networks will be merged for even greater survivability and interoperability using end-to-end multilevel security protection. Also, the aging Automatic Processing Exchanges will be replaced by the Inter-Service/Agency Automated Message

Processing Exchange (I-S/A AMPE). With initial fielding being projected for 1988, I-S/A AMPE will provide multilevel secure message processing with significantly enhanced performance using the DDN for the transmission backbone.

These new systems described above will be designed for significantly improved interoperability for better connectivity and security among the military departments and with our allies by exploiting common standards and protocols. This shared use of communications assets will enhance the survivability of the DCS.

A major initiative we will undertake in FY 1987 is the development of a Universal Modem which will improve the interoperability, endurability, and nuclear survivability of Defense Satellite Communications Systems (DSCS) critical users.

Long-haul communications (DCS) function also provides necessary worldwide communications support for the President, Vice President, key White House personnel, and Secret Service protective elements. FY 1987 funds for this effort will continue to provide acquisition and contractual support for communications and automatic data processing equipment requirements of the White House Communications Agency.

| | FY 1987 ($ in Millions) | | | |
|---|---|---|---|---|
| | RDT&E | PROC | O&M | TOTAL |
| E. SUPPORT OF THE NATIONAL COMMUNICATIONS SYSTEM (NCS): | 3.0 | 6.5 | 59.8 | 69.4 |

For the NCS, we will continue to work to ensure that survivable, endurable telecommunications systems are available to meet the needs of the entire Federal government. This involves more than just our DCS. Our Federal systems are highly reliant on the commercial structure. Therefore, any attempt we make to ensure this survivable structure must take into account both Government owned and commercially leased systems.

The FY 1987 request includes funds for the extension of the Washington Area Wideband System (WAWS) in the National Coordinating Center (NCC), a joint government - industry operations center which assists in coordinating the initiation and restoration of National Security Emergency Preparedness (NSEP) Telecommunications; Continuity of Government operations support; Nationwide Emergency Telecommunications System support; and for National Security Telecommunications Policy Initiatives. These projects are all integral components of the program to improve the NCS's ability to perform critical emergency telecommunications management functions effectively and efficiently during all stages and instances of national emergency.

In FY 1987, we will also continue efforts initiated under National Security Decision Directive 97 to complete Electromagnetic Pulse (EMP) vulnerability analysis of fiber optic cables, and continue development of cost-effective nuclear effects mitigation measures for those facilities previously identified as having the greatest value to the preservation of traffic handling capacity of the Nationwide Emergency Telecommunications System (NETS) and its supporting transmission facilities. Support of Commercial Satellite Survivability efforts called for by National Security Decision Directive 97 will also continue.

| | FY 1987 ($ in Millions) | | | | |
|---|---|---|---|---|---|
| | RDT&E | PROC | O&M | MILCON | TOTAL |
| 4. MANAGEMENT HEADQUARTERS | - | 1.0 | 23.9 | 7.6 | 32.5 |

This mission area coordinates and provides technical management, direction, administrative support necessary to accomplish our $C^3$ mission.

It includes my immediate staff, resource management, personnel staffing and manpower planning, supply and services, and security functions.

In FY 1987, we are requesting \$32.5 Million for Management Headquarters. This amount includes \$7.6 Million of military construction funds to provide for a computer and administrative replacement facility for the Defense Commercial Communications Office (DECCO) at Scott Air Force Base, Illinois.

DECCO is a field activity of our Resource Management Directorate. The mission of DECCO is to acquire, on a centralized basis, all commercial long haul $C^3$ voice and data requirements of the DoD, the Military Departments, the Federal Aviation Adminstration and other federal agencies.

## CONCLUSION

Our FY 1987 $C^3$ budget request before you today contains the necessary funding to execute the primary mission of DCA: to ensure that the most critical $C^3$ needs of the Department of Defense (DoD) and other Federal Agencies can be met in all conditions from peace through war. Our FY 1987 request represents our continued commitment in meeting our operational and technological challenges in this area and the continuation of communications improvements made over the last five years in modernization, readiness, sustainability, and survivability of $C^3$ systems.

Our FY 1987 $C^3$ budget request reflects the necessary resources in response to a rapidly evolving $C^3$ environment and the recognition of $C^3$ as a critical top priority mission. Our request of \$495.4 Million will enable us to make a cost effective contribution to an improved Defense posture by meeting the most urgent and higher priority requirements for $C^3$.

I thank you for your support in previous years and urge your continued support this year to ensure that rapidly evolving $C^3$ services will be available to our decision makers and deployed forces.

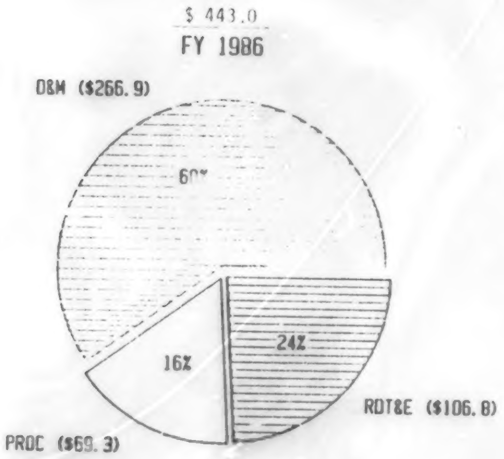
Mr. Chairman, this concludes my prepared statement. I would be happy to answer any questions you may have at this time.

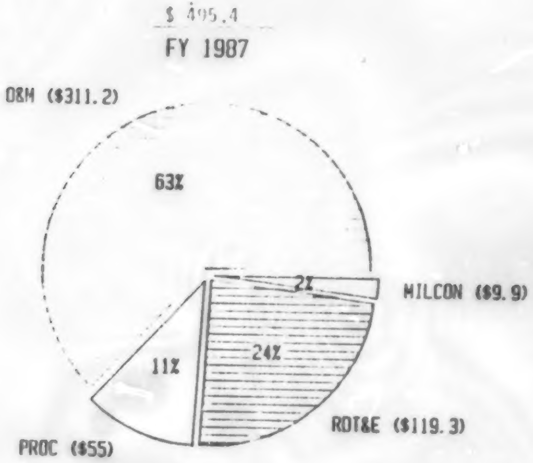
DEFENSE COMMUNICATIONS AGENCY
FY 1987 PRESIDENT'S BUDGET

5 FEB 86

% OF $C^3$ BUDGET BY APPROPRIATION

($ IN MILLIONS)





## DEFENSE COMMUNICATIONS AGENCY
## FY 1987 PRESIDENT'S BUDGET

### $C^3$ FUNDING BY APPROPRIATION CATEGORY

| | ($ in Millions) | |
|---|---|---|
| RDT&E BY PROGRAM ELEMENT | FY 1986 | FY 1987 |
| PE 21135K, CINC $C^2$ Initiatives | 2.1 | 2.2 |
| PE 32016K, NMCS-Wide Support | 36.9 | 10.5 |
| PE 32019K, WWMCCS System Engineer | 21.0 | 19.3 |
| PE 33126K, Long-Haul Comm. (DCS) | 16.3 | 39.1 |
| PE 33127K, Support of the NCS | 2.8 | 3.0 |
| PE 33131K, MEECN | 11.8 | 11.3 |
| PE 35108K, $C^2$ Research Center | 1.8 | 2.1 |
| PE 62734K, Island Sun | 14.1 | 31.8 |
| TOTAL RDT&E | 106.8 | 119.3 |
| PROCUREMENT BY P-1 LINE ITEM: | | |
| WWMCCS ADP | 15.0 | 14.9 |
| DSN | 10.8 | - |
| ITEMS LESS THAN $2 MILLION | 43.5 | 40.1 |
| TOTAL PROCUREMENT | 69.3 | 55.0 |
| O&M BY BUDGET ACTIVITY: | | |
| Budget Activity 3, Communications and Intelligence | 266.9 | 311.2 |
| TOTAL O&M | 266.9 | 311.2 |
| MILCON BY PROJECT: | | |
| Alteration/Expansion of Pentagon Office Space | - | 2.3 |
| Computer and Administration Replacement Facility for the Defense Commercial Communications Office (DECCO), Scott AFB, Illinois | - | 7.6 |
| TOTAL MILCON | - | 9.9 |
| TOTAL BUDGET | 443.0 | 495.4 |

DEFENSE COMMUNICATIONS AGENCY
FY 1987 PRESIDENT'S BUDGET

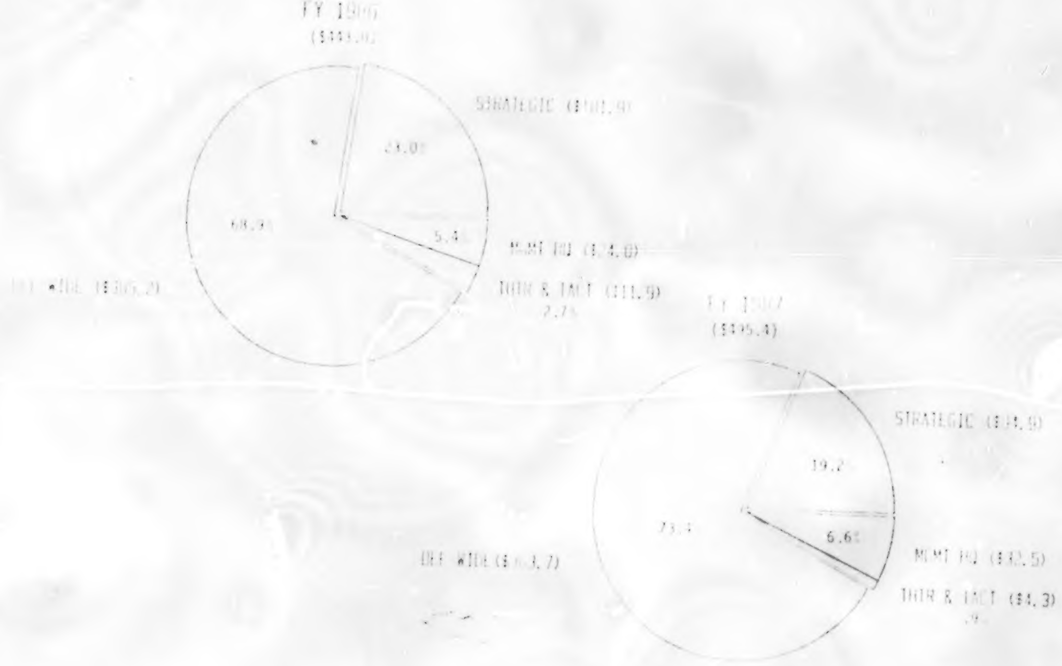
5 February 1986

## FUNDING BY $C^3$ MISSION AREA
(TOA in Millions)

| | FY 1986 | FY 1987 |
|---|---|---|
| STRATEGIC $C^3$ | $ 101.9 | $ 94.9 |
| NMCS-Wide Support | 41.9 | 20.2 |
| WWMCCS System Engineering | 34.1 | 31.6 |
| MEECN | 11.8 | 11.3 |
| Island Sun | 14.1 | 31.8 |
| THEATER AND TACTICAL $C^3$ | $ 11.9 | $ 4.3 |
| CINC Initiatives | 10.1 | 2.2 |
| $C^2$ Research Center | 1.8 | 2.1 |
| DEFENSE-WIDE $C^3$ | $ 305.2 | $ 363.7 |
| WWMCCS ADP-JTSA | 25.8 | 27.8 |
| WWMCCS ADP-NMCS | 57.5 | 59.9 |
| WIS | 12.6 | 25.6 |
| Long-Haul Comm. DCS | 162.1 | 181.0 |
| Support of the NCS | 47.2 | 69.5 |
| MANAGEMENT HEADQUARTERS | $ 24.0 | $ 32.5 |
| TOTAL BUDGET | $ 443.0 | $ 495.4 |

DEFENSE COMMUNICATIONS AGENCY
FY 1987 PRESIDENT's BUDGET
C³ BUDGET BY MISSION AREA
($ in Millions)

5 FEB 86



DEFENSE COMMUNICATIONS AGENCY 5 February 1986
FY 1987 PRESIDENT'S BUDGET

## FY 1987 $C^3$ FUNDING BY MISSION AREA AND APPROPRIATION
($ in Millions)

| STRATEGIC $C^3$ | RDT&E | PROC | O&M | MILCON | TOTAL |
|---|---|---|---|---|---|
| NMCS-Wide Support | 10.5 | 3.7 | 6.0 | - | 20.2 |
| WWMCCS System Engineering | 19.3 | (*) | 12.3 | - | 31.6 |
| MEECN | 11.3 | - | - | - | 11.3 |
| Island Sun | 31.8 | - | - | - | 31.8 |
| TOTAL STRATEGIC $C^3$ | 72.9 | 3.7 | 18.3 | - | 94.9 |
| THEATER AND TACTICAL $C^3$ | | | | | |
| CINC Initiatives | 2.2 | - | - | - | 2.2 |
| $C^2$ Research Center | 2.1 | - | - | - | 2.1 |
| TOTAL THEATER AND TACTICAL $C^3$ | 4.3 | - | - | - | 4.3 |
| DEFENSE-WIDE $C^3$ | | | | | |
| WWMCCS ADP-JTSA | - | .4 | 27.4 | - | 27.8 |
| WWMCCS ADP-NMCS | - | 2.8 | 54.8 | 2.3 | 59.9 |
| WIS | - | 11.7 | 13.9 | - | 25.6 |
| Long-Haul Comm. DCS | 39.1 | 28.8 | 113.1 | - | 181.0 |
| Support of the NCS | 3.0 | 6.6 | 59.8 | - | 69.4 |
| TOTAL DEFENSE-WIDE $C^3$ | 42.1 | 50.3 | 269.0 | 2.3 | 363.7 |
| MANAGEMENT HEADQUARTERS | - | 1.0 | 23.9 | 7.6 | 32.5 |
| TOTAL MANAGEMENT HEADQUARTERS | - | 1.0 | 23.9 | 7.6 | 32.5 |
| TOTAL BUDGET | 119.3 | 55.0 | 311.2 | 9.9 | 495.4 |

(*) Less than $100 Thousand.

Mr. CHAPPELL. That was brief, wasn't it?
Thank you.

## GROUND WAVE EMERGENCY NETWORK (GWEN)

As a result of the recent threat reassessment by the Air Force, the DoD has ———. Part of the Defense Communications Agency RDT&E program for fiscal year 1986 is to analyze four areas of MEECN (which includes GWEN) vulnerability: jamming, EMP/HEMP, COMSEC, and ASAT.

Please summarize the highlights of your vulnerability analysis as it relates to GWEN.

General POWERS. The analysis work that we have done on GWEN ———, was based upon a precise better definition of the location of those nodes that will allow us to ——— that exists today based upon today's programmatic requirements with respect to the installation and implementation of those GWEN nodes.

Our analysis shows that in the first go-around, ———.

Mr. CHAPPELL. You think your analysis is consistent with the reduction of those numbers?

General POWERS. Our analysis is consistent with the ——— as we now know it to be.

## INTEROPERABILITY OF STRATEGIC SYSTEMS

Mr. CHAPPELL. Let me talk about strategy first. How does the Defense Communications Agency ensure that interoperability is properly considered during design development and/or modification of architectures involving strategic $C^3$ systems?

General POWERS. It is a very tedious process. The principal systems from the Defense Communications System side of the house is one to replace AUTOVON and make sure those systems are capable of interfacing with tactical systems and other systems required to interface with them.

The Defense Data Network also goes through the same interoperability analysis. Concerning the satellite systems, such as the jam-resistant secure systems, we work those interoperability problems with the Services, ensuring that in the development design and architectural relationship of the systems, they are interoperable from the start.

Part of our project is to work closely with our sister agency, the Joint Tactical C3 Agency, on a daily basis to ensure their systems are interoperable with the strategic systems.

Tactical systems include the TRI-TAC switches, both voice and digital.

Mr. CHAPPELL. Are you aware of any recommendations to improve the interoperability that needs to be done, anything we can do to help with reference to strategic?

General POWERS. We have enough programs on our books today that are addressing those interoperability problems and your support of those DCA programs would help, Mr. Chairman.

Mr. CHAPPELL. Describe, if you will, the functions of the Defense Communications Agency under the memorandum of policy.

General POWERS. The Defense Communications Agency's Functions with respect to the memorandum of policy, are many.

Mr. **Chappell**. I am talking about primarily 160.

General **Powers**. That deals with interoperability. We are charged in that policy for any new programs that we bring onboard to ensure that they have been fully coordinated with all the CINCS, all the Services, and the defense agencies to ensure that we design interoperability. We should not proceed into programs that don't meet the existing and future interoperability requirements of those combatant commands.

My judgment is, to be frank, we do that very, very well in the Defense Communications Agency.

Mr. **Chappell**. The JCS memorandum revises a November 1, 1986, document. Earlier attempts at revision in 1980 and 1984 failed. Obviously, it is not without controversial issues.

Are you satisfied in general that this document has sufficient teeth to do the job?

General **Powers**. The document you refer to, I believe, is a January 1986 document, so it is barely six months old. We can make it work. I am not saying it is smooth sailing, but we need an opportunity to make it work.

There are problems related to those cost factors if you want to achieve total interoperability, so full implementation will take some time.

### WORLDWIDE MILITARY COMMAND AND CONTROL INFORMATION SYSTEM (WIS)

Mr. **Chappell**. The worldwide military command and control information system (WIS) is DoD's modernization program for the Worldwide Military Command and Control System (WWMCCS) ADP hardware and software.

Since establishing the need for the worldwide military command and control information system, about how much has been expended through fiscal year 1986 to upgrade the WWMCCS ADP systems?

General **Powers**. Mr. Chairman, I would like to provide those numbers for the record.

[The information follows:]

The need for the WWMCCS Information System was formalized by the DEPSECDEF in a Joint Mission Element Need Statement for WIS Modernizaiton on 18 December 1981. Since that time, approximately $66 million has been expended through fiscal year 1986 to upgrade the WWMCCS ADP Systems at installations worldwide.

Mr. **Chappell**. Do you have any improvements in ADP support? What improvements in ADP support does this expenditure provide to the national command authority?

General **Powers**. It provides a capability to transfer data base information regarding status of forces, joint operational procedures, and deployment support from one command center to the other.

The other side of it is improvement associated with communications that allows the flow of data to take place.

As you realize, we are in the early stages of bringing on the WWMCCS Information System to accomplish better those needed tasks of the various CINCS.

Mr. **Chappell**. Multilevel security was established as a requirement for WWMCCS ADP systems years ago, but the WIS Master

Program Plan dated November 1984 specifies that state-of-the-art technology cannot provide multilevel security for individual WIS components.

What emphasis is being placed on the development of this technology?

General Powers. There have been a series of improvements over the last two years, Mr. Chairman. Presently, we are working on a cryptographic system called BLACKER which will give us multilevel secure communications links for each user communication between host computers.

On the computer side, we are looking to initiate multilevel security in the WIS program by having capability for two levels of security such as top secret and secret. It will take until 1990 to obtain a full multlevel security capability for WIS Block C.

The Interservice Agency Automatic Processing Equipment will also be designed to those so-called A-1 specs, which are multilevel secure, and we expect that first effort to be about 1990, which will provide multilevel security in our upgrades to the AUTODIN switches.

So we are working multilevel secure problems.

Mr. Chappell. Last year some early milestones for WIS were delayed by about a year. In general, what impact will these delays have on the budget request for 1987?

General Powers. Our budget request for 1987 will not be affected by any WIS delays. The first Block B funding is required in fiscal year 1988, and that will be the first time we would have to adjust the budget in accordance with whatever slip is announced in the overall program.

Mr. Chappell. What about the current statement of the program milestones? Can you do that or do you want to put it in the record?

General Powers. I would like to put it in the record, but I have no problem with the way the program is proceeding now. We work closely with the JPMO in bringing the program on.

My responsibility is to be able to take over maintenance and integration for the WIS program software dealing with the JOPES, the RUM, and CPE and embed them in the new computer system starting in 1988 with the common user system, the local area network, and the current Honeywell systems and having the ability of swapping out the Honeywell 6000 and DPS-8, or leaving those systems in.

Our key effort is to make sure we bring on the DoD standard protocols to allow all those things to happen and we are on track.

Mr. Chappell. Please answer that and the rest of the questions for the record.

[Clerk's note.—Questions submitted by Mr. Chappell and the answers thereto follow:]

*Question.* What are the prospects for achieving multilevel security capability in the near future?

Answer. Although some progress has been made in achieving a multilevel security capability, it has been slow because this is a very complex technical problem. Achieving this capability by the WIS Block A timeframe is not possible. Attaining a controlled mode of security is an objective in the Block B timeframe. A full multilevel security capability should not be expected before the WIS Block C timeframe of after 1990.

*Question.* Please put in the record a current statement of program milestones.

Answer. The current statement of program milestones is contained in the WIS Master Program Management Plan, dated January 1986, Appendix A. The program is structured to provide incrementally deployed capabilities. A summary of the milestones follows: first, Block A deployment will begin in the fourth quarter 1987 and be completed in the fourth quarter 1989; and second, Block B deployment will begin in the third quarter 1988 and end in the third quarter 1990. Block C will enter the definition stage in the third quarter of 1986, so deployment milestones have not yet been set.

*Question.* The budget justifications show the joint mission hardware contract is planned for the third quarter of fiscal year 87, while the initial operational capability for the data base management system software is scheduled for fiscal year 89. Is it your intention for the DBMS to be selected before or concurrent with the hardware? If not, why not?

Answer. It is the intent to select DBMS concurrently with the joint mission hardware. A prototype DBMS has been selected based on extensive analysis of the current state of the art and competition. The prototype will be used to define hardware requirements, and to conduct software and data base conversion experiments that will lead to a deployable DBMS initial operational capability for the joint mission processing environment.

*Question.* When the WIS program was initiated, a requirement was established for the replacement of joint processors. Is the requirement for replacement of joint processors assessed to be as strong as it was when the program began?

Answer. The requirement for replacement of joint processors is less now than when the WIS program was initiated because of the selected improvements that have been made to the existing WWMCCS ADP system. The need still exists to consider replacement of the upgraded joint processors for WIS Block B to ensure that the deployed capability is as close to the state of the art as possible and to ensure that the advantages of competition are exploited in this program.

[CLERK'S NOTE.—End of questions submitted by Mr. Chappell.]

### UNIVERSAL MODEM

Mr. CHAPPELL. The conference report on the Defense Appropriations Act for fiscal year 1986 directed the DoD to submit a report on procurement and fielding of a universal modem which fully considered the sizable sunk costs in existing hardware and software.

That report was due on April 1, 1986. When do you expect the DoD will get that report to the committee?

General POWERS. I have to apologize to you, Mr. Chairman. The report was prepared by us in the middle of March and submitted through channels to OSD. It simply was not mailed on to you. The report was signed off the day after they found out the error.

The report addressing the universal modem says we need to have a cheaper modem that can do the job of mitigation of EMP and scintillation. Today's technology in the late 1980s and early 1990s says it can be done in a very small, simple box with more capability for less money than the very big, bulky system we now use to accomplish the existing job.

As far as the transition from the present systems to the new universal modem, and there will be several classes of modems, we are still refining those transitional steps as we proceed.

I apologize for the report being late, but it is in the mail and you should receive it shortly.

Mr. CHAPPELL. Thank you.

The universal modem is intended to permit direct communications connectivity between selected Defense Satellite Communications System (DSCS) users.

Describe how the DSCS now now operates through "gateways" and tell the committee what gateway problems will be solved with the universal modem program.

General POWERS. Yes, Mr. Chairman. Let me take your second question first.

If we have a universal modem that is the interoperable, and we plan to make sure it is interoperable, we can, over a period of time, do away with the classical gateway stations.

With respect to the first part of your question, the way the gateway stations work today, the operator at the station has to make a series of physical and technical moves to ensure that his satellite terminal can receive the data from a modem that is not standardized with his. Very simply, we call that a Rack-20 kind of problem. We do that extremely well.

We have a series of exercises three or four times a year to allow the Defense Satellite Communications system to receive data from any number of definite ground satellite terminals.

Mr. CHAPPELL. Is there an identified requirement for all strategic and tactical users to communicate directly with each other?

General POWERS. Yes. This is generic to the kind of business that we are in to make sure that tactical and strategic systems can interface with one another. My role as the Director of DCA and the manager of the National Communications System is to provide an umbilical cord to allow the tactical systems to plug into DCS systems, the NATO systems to plug into the DCS systems and the civil systems to plug int the DCS.

Mr. CHAPPELL. What other user requirement is the universal modem intended to satisfy that could not be met with currently used modems when modified?

General POWERS. The advent of the universal modem not only addresses the 1980 threat, but it will be addressing the 1990 threats.

The modems we have right now are based upon the mid-1970 technology and the threat known to exist at that time.

Mr. CHAPPELL. Is the universal modem intended to satisfy certain higher data rate transmissions required for special users?

General POWERS. The universal modem will be designed with the ability to transport data from a low data rate to a high data rate of about 19.2 kilobits. Based upon a reasonable assessment of what can be done in today's technology and in future technology to allow that total transmission of data across the spectrum, the high end is 19.2 kilobits. That should satisfy almost all of the users.

Mr. CHAPPELL. Is it going to cost more money to do what you are talking about here?

General POWERS. The design to cost goal of the universal modem should make it significantly cheaper than any modem we have available today, and make this transition extremely economical.

Mr. CHAPPELL. You are requesting $18 million for this program, right?

General POWERS. Yes, in this year's budget.

Mr. CHAPPELL. What is going to be the total cost of the program?

General POWERS. We are planning, over the next two or three years of research and development, to spend around $60 million to produce an item that will be designed to cost in the area of probably around $200,000 per unit as opposed to a cost today in the millions. That is our goal.

### NUCLEAR COMMAND AND CONTROL

Mr. CHAPPELL. The use of nuclear weapons cannot be undertaken unless an EAM (emergency action message) is transmitted. According to the National Security Agency (NSA) which produces the codes and authenticators used for emergency action messages "EAMs are based on obsolete manual codes and authenticators that suffer from inherent vulnerabilities to: spoofing, transmission errors, material compromises, and misuse."

Why does such a crucial function as transmitting an EAM have so many severe shortcomings?

General POWERS. Well, it is probably a long story, but I would like to make it as short as possible.

The purpose of EAMs is to transmit the emergency action message to alert the nuclear forces. ———.

It requires you to come up with a text of a message that can be transmitted over all the systems and get to the intended user.

With respect to the fact that there are a number of codes in the design of the message itself, that is also required to ensure that the message is the right message. Recognizing that part of the problem goes back a long way. There are steps under way to make transmission of that message easier. There are procedures being worked on by the Joint Staff to see if we can make the text and the transmission better with today's technology.

Mr. CHAPPELL. General, thank you very much. We have other questions for the record, but thank you very much.

[CLERK'S NOTE.—Questions submitted by Mr. Chappell and the answers thereto follow:]

### INTEROPERABILITY OF TACTICAL AND STRATEGIC COMMAND, CONTROL AND COMMUNICATIONS SYSTEMS

*Question*. Would you please outline for the Committee your position and what further needs to be done to ensure compatibility and interoperability of tactical C$^3$I systems?

Answer. The wording of this question can cause confusion over the term "tactical" and the role of the DCA in the tactical arena.

As commonly used, the term "tactical' excludes the Defense Communications System (DCS). Ensuring interoperability of tactical $C^3I$ systems is the responsibility of the JT$C^3$A; DCA has some interest in this broad area. Practically speaking, however, the DCS in various overseas theaters, while often referred to as a "Strategic" system, supports the Theater CINC, upper echelon theater support activities (e.g., theater-level intelligence and logistics), and communications to tactical airbased. Consequently, if "tactical" is more broadly redefined to encompass all $C^3I$ activities in a theater, then the interface of the DCS with other U.S. tactical communications (e.g., the TRI-TAC system) and with NATO and allied "strategic" communications is an important DCA tactical interoperability concern.

Improving these interfaces is a major DCA activity; and we play an activist role in indentifying requirements and solutions. We have energetic Theater Communications and Military Satellite Architecture programs aimed at identifying interoperability problems and potential solutions. These activities have identified several communications interoperability problems for which solutions and programs are not now in hand. These include:

Identification of the best locations to interconnect the DCA to NATO and allied communications to improve the survivability of service to all customers.

Mechanisms for responsively and effectively controlling a damaged network that consists of the DCS plus neighboring systems.

How to best interface or segregate the several secure voice programs that will have elements in the theaters (e.g., TRI-TAC DSVT, STU-II M, STU-III, ELCROVOX, Red Switch).

How to best allocate power and achieve direct interoperability, in a stressed environment, between the satellite terminals of the tactical ground mobile forces and the strategic community.

So the short summary to a long answer is to let DCA keep working with its tactical and allied counterparts on the major issues on DCS interoperability in theaters.

*Question.* One provision of the January 7, 1986, Joint Chiefs of Staff Memorandum of Policy No. 160 establishes a Tactical $C^3I$ Interoperability Improvement Program that features annual indentification of issues, and a system from prioritizing and funding the ones that should be dealt with first. Do you anticipate that this improvement program will play an important role in achieving interoperability?

Answer. The establishment of the Tactical $C^3I$ Interoperability Improvement Program via JCS MOP 160 is a noteworthy accomplishment. While this program has not fully commenced, it promises to be a positive step toward building consensus and support to undertake solutions to the highest priority interoperability issues. It benefits from more CINC input than previous forums. The program is patterned after the DCS Five Year Plan prioritization process which DCA has used for years with some success. Of course, the initial consideration of potential interoperability issues depends on Services, CINCs, and Agencies identifying them. It remains to be seen how effective the parties will be in so doing. As stated previously, DCA intends to be activist in this area.

*Question.* What other mechanisms does the Defense Communications Agency have available to it to ensure that interoperability is appropriately considered during design, development, and/or modification of architectures involving tactical $C^3$ systems?

Answer. With or without a formal program such as the Tactical $C^3I$ Interoperability Improvement Program, DCA has always had and used the option of bringing interoperability issues forward to the appropriate joint or combined arenas. A recent example involves the area of Meteor Burst Communications (MBC) which are intended primarily for strategic nuclear communications but may also have theater applications. DCA recently identified the potential emergence of several MBC systems among the Services, convinced JCS to start interoperability actions, and accepted tasking to develop DOD standards. DCA has also participated in NATO committees arranging interoperability between the NATO IVSN and US AUTOVON and between the NATO TARE and US AUTODIN systems. DCA and $JTC^3A$ work on the cooperative development of standards common to long haul and tactical communications. Together we work on the cooperative development of DCS-tactical interfaces; recently we have been testing interoperability of the TRI-TAC TTC-39 Switch with the DCS. DCA and $JTC^3A$ have worked out a memorandum of agreement for DCA to continue to work on $C^3$ for non-strategic nuclear forces; this is an area within the charter of $JTC^3A$ but in which DCA has conducted a continuing program. These activities all fall outside or on the border of the provisions of MOP 160, but demonstrate the other avenues DCA can and does use to promote interoperability.

### UNIVERSAL MODEM

*Question.* The Department of Defense has spent over $300 million to acquire modems currently in use and plans to spend another $200 million to meet inventory objectives. Why should the DOD initiate a new modem program while it is in the process of spending very substantial sums to acquire and modify modems in the current program?

Answer. Concerns have been raised by OSD and Members of Congress over the lack of communications interoperability between forces in recent incidents of hostility and during reconstitution of forces in a protracted nuclear war. In addition to the anti-jamming (AJ) capability provided by existing Modems, there is an urgent need to also provide the capability to communicate through nuclear induced propagation disturbances. The DCA purposed modification to the AN/USC-28 modem is intended to expedite the latter capability to the critical users by the mid-1988's. The new modem will provide in the early mid-1990's the critically required direct interoperability among the US forces, the allied forces, and in addition, provide enhanced AJ and operation in nuclear stressed environment. This new modem is the basis to standardize and perpetuate interoperability.

*Question.* What is the schedule for acquiring, modifying, and deploying the current modems? Provide the details for the record.

Answer. The current modems are being implemented at this time and are scheduled for implementation through the early

1990's. The following is the cumulative projected implementation schedule for current jam resistant modems.

MODEM UNITS

| Modem | Mid 1980's | Late 1980's | Early 1990's |
|---|---|---|---|
| AN/USC-28 | 465 | 739 | |
| AJCM | | 851 | |
| OM-55 | 60 | | |

Approximately 40% of the total number of AN/USC-28 Modem units will be modified for support of the critical users to counter the near term nuclear threat. This is a total of approximately 300 units.

*Question.* What is the expected useful life of the current modems?

Answer. The current modems will have an expected useful life of approximately 10 years.

*Question.* Is the DoD intending to replace the current modems with the Universal Modem in the near term? If so, why?

Answer. The Universal Modem is not intended to be a replacement modem. However, some users could use it as a replacement modem for the USC-28 or OM-55. The Universal Modem is being designed to augment existing earth terminal equipments providing critical communications interoperability in a nuclear stressed environment.

*Question.* Please provide for the record how the planned schedule for the Universal Modem affects the schedule for the acquisition and modification, and the planned useful life of the current modems?

Answer. The Universal Modem is presently planned to begin fielding in 1991. The interaction between the Universal Modem and the current programs will be addressed in the Universal Modem transition plan which is being developed at this time.

## Nuclear Command and Control

*Question.* What is being done to rectify the situation concerning shortcomings of transmitting EAMs?

Answer. The EAM transmission system and supporting systems utilizing the RF spectrum for VLF/LF to EHF. Specific equipment improvements to all systems across the frequency spectrum have been initiated and programmed for by CINCs/Services and DCA to rectify equipment shortcomings in the current system. In addition, our testing of the VLF/LF survivable communications systems has increased significantly in FY 1986 to assist us in identifying operational, procedural and training deficiencies that may exist. The new WABNRES/ANMCC VLF/LF Test Program has been particularly successful in this respect. The format and length of the EAM is under study by OJCS with the view to reducing the preparation and transmission times and increasing the Probability of Correct Message Receipt (PCMR).

*Question.* Provide for the record as to what funding is in the FY 1987 budget and the out-years for upgrading equipment for this important mission.

Answer. For FY 1987 DoD has requested $105.6 million RDT&E and $123.4 million Procurement for the upgrades to this program. FY 1988–1991 funds requested for this effort are $127.2 million RDT&E and $268.9 million Procurement. The RDT&E funds shown above support efforts by Navy, Air Force and DCA. The Procurement funds are managed by the Air Force.

## INTERNATIONAL COMMERCIAL COMMUNICATION ACQUISIITON

### Facilities

*Question.* What type of international commercial facilities does DoD utilize for its communication requirements?

Answer. Satellite, undersea cable, microwave, and tropospheric scatter system from Okinawa to Japan, and telephone exchanges being implemented by the Oahu Telephone System Program.

*Question.* What areas of coverage are required in the Pacific and Atlantic Ocean regions?

Answer. Hawaii, Philippines, Japan, Korea, Alaska, United Kingdom, Germany, Spain, Italy, Australia, and New Zealand.

*Question.* How much of this traffic is carried over satellite as opposed to terrestrial devices?

Answer. Approximately 25%.

*Question.* How much satellite traffic is routed over INTELSAT, for example?

Answer. Approximately 27%, with a few national circuits going over domestic satellite.

*Question.* Are DoD communication facilities adequate for present and projected demand?

Answer. DoD requirements are not only expanding but they're changing in scope and character. Data requirements are surpassing voice in many areas of interest as linking of computer systems becomes essential. Immediate extension of communications capability to new geographic locations as well as alternate routing around other locations is now essential. This new flexibility and expanding networking is dependent on full support of our budgetary submissions and planning guidance.

*Question.* Specifically, do current commercial satellite facilities have adequate security and technological features to satisfy DoD commercial requirements, or is upgrading required?

Answer. No, there is a need to upgrade these facilities to provide bulk encryption, and to provide interoperability between the carriers.

*Question.* What are the key requirements of DoD commercial communication acquisition policies, such as end-to-end service procurement, levels of security, and hardening?

Answer. The key requirements are those that assure the acquisition of commercial communication services meeting the needs of DoD at a reasonable cost. The need for security and hardening vary with the use of the circuit. End-to-end service has been a stated goal of the military departments, but the divestiture of the

Bell System and the FCC's Computer II Decisions have made it increasingly difficult to achieve. Conversely, opening the communications markets has allowed us to raise the importance of competition as a commercial communications acquisition policy.

*Question.* Do these requirements dictate the use of cable over satellite?

Answer. Requirements dictate the choice of media only to the extent that some media offer inherent advantages over other media. Fiber optic cables may be less susceptible to interception and electromagnetic interference. Satellite offers quick access to isolated areas. Microwave and tropo offer greater opportunities for richer networking, survivability, and access with limited right-of-way. The objective is to provide a mix of all available media, taking advantage of each inherent benefit and providing high overall system survivability.

## Services

*Question.* What is the magnitude and type of international services DoD typically lease from commercial vendors or international carriers for data, voice and video?

Answer. Where there are no Government Furnished Equipment (GFE) systems, entire services are leased. Approximately 150 thousand individual circuits are leased in support of DoD. These services are primarily voice circuits and alternative voice/data (modem) circuits up to 9.6 KBS. Where there are digital facilities available , 50 KBS, 56 KBS, and 64 KBS are leased.

*Question.* What are the data rates/speeds required for these services?

Answer. 75 BAUD up to 9.6 KBS, and 50 KBS, 56 KBS, and 64 KBS where digital facilities are available.

*Question.* Of the types of services required over satellites, what frequency allocations are currently used? What is the anticipated use of C-band and KU-band?

Answer. In the case of DCTN and the DCS 1.544 MBS leased satellite program, C-band is primarily used. KU-band is used for special and contingency programs such as the presidential communications support program. Due to restrictions set forth by the providing vendor's equipment and reliability requirements, the ratio of C-band vs. KU-band in 80/20.

*Question.* What type of service does DoD anticipate using in the future?

Answer. All types of commercial services are being planned for in the future to meet mix-of-media policy to enhance survivability of DoD communications network.

*Question.* What place do international satellites with small customer premises and transoceanic fiber optic cables, and other major types of services hold in DoD plans?

Answer. Direction for DoD support has been transoceanic fiber optic cables such as TAT8, TAT9, and TPC3.

## Costs

*Question.* How much does DoD spend on *International telecommunications* per year?

Answer. $59.8M for international leased services.

*Question.* How much of this is spent on commercial capacity?

Answer. All.

*Question.* What is the aggregate commercial communications budget allocated for cable, and for satellite?

Answer. 47.2M for cable and 12.6M for satellite.

*Question.* What are DoD's budget projections for international, domestic, satellite and cable commercial communications services?

Answer. DCA leases approximately 15 million miles of circuitry in the CONUS and internationally for DoD. There are approximately 150 thousand individual circuits. The bill for circuitry and equipment leased by DCA for DoD is projected at $1.0B for FY 1986 and $1.1B for FY 1987.

[CLERK'S NOTE.—End of questions submitted by Mr. Chappell.]

WEDNESDAY, APRIL 16, 1986.

# ARMY COMMUNICATIONS, COMMAND AND CONTROL

## WITNESS

BRIG. GEN. BILLY M. THOMAS, USA, DEPUTY DIRECTOR, COMBAT SUPPORT SYSTEMS, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR RESEARCH, DEVELOPMENT AND ACQUISITION, DEPARTMENT OF THE ARMY

## INTRODUCTION

Mr. CHAPPELL. The Army budget for command, control and communications will be presented by Brigadier General Billy M. Thomas, Deputy Director of Combat Support Systems, Office of the Deputy Chief of Staff for Research, Development, and Acquisition, Department of the Army.

General Thomas, welcome back to the committee again this year. We will place your entire statement in the record. Please proceed.

## SUMMARY STATEMENT OF GENERAL THOMAS

General THOMAS. [Chart No. 1.] Thank you very much, Mr. Chairman.

I am happy to be here before the committee again. I would like to proceed with a short verbal introduction on the Army's Command, Control, Communications and Intelligence budget submit for 1987.

## C$^3$I PROGRAMS

[Chart No. 2.] The C$^3$I program consists of these basic five areas: Strategic Communications, in which we fund for the DoD programs and in fact support some of the programs that General Powers has just discussed; Sustaining Base Communications for all the posts, camps, and stations worldwide to maintain day-to-day peacetime operations and the supporting automation; Tactical Communications, Battlefield Command and Control, and Reconnaissance Surveillance Target Acquisition, IEW.

## FY 87 PRESIDENT'S BUDGET

[Chart No. 3.] This represents the C$^3$I portion of the Army's procurement budget this year and represents approximately 20 percent of the total procurement budget.

## PROCUREMENT BUDGET COMPARISON

[Chart No. 4.] We recognize there is a growth in this area. In fact, this is one of the few areas in which the Army has any growth.

Mr. Chairman, this was done very consciously and very specifically on the part of the Army leadership. As you will note, the growth indicated in the Tactical Communications, FY 86 to FY 87 and the Battlefield Command and Control and the RSTA IEW area. I should note that this represents a reduction of some $900 million from the 1987 column of the 1986 budget, so the growth has already been significantly reduced during the last year as we prepared the FY87 submit.

### CORPS COMMANDER'S BATTLEFIELD

[Chart No. 5.] I would like to discuss the reason for the need for growth in the C$^3$I area for a moment. From the perspective of the Corps Commander, the first thing he has to know is where the threat is arrayed. He is faced with a varying force ratio across the corps front with a variance of as much as six-to-one on the right to one-to-one in the middle. He must have the C$^3$I assets to know what the threat array is and to deploy his forces against that array.

As the battle proceeds, it is essential that he have the ability to track the battle, understand what penetrations are occurring, understand where the enemy second echelon is going to be committed, because if the penetration actually occurs on the left flank, the left side, and the second echelon may go over there, he has a reserve he must deploy and he has to move all the artillery and all the support equipment to meet that threat.

Once he commits it the reserve is gone. he must commit it to the correct place the first time. There is no second chance. I have been in the 7th Corps under these circumstances.

So the entire C$^3$I business is the key on the critical decision he makes on commitment of that reserve.

### C$^3$I REACTION TIME

[Chart No. 6.] In showing that more clearly as a circle on the left hand side of the chart, we have portrayed what I would call the C$^3$I information loop closure. The intelligence and sensors you see at the top start the process. That information has to flow through the communications link, it has to be fused and analyzed and provided to the commanders; he then makes the decision and his decisions are transmitted to the maneuver and fire forces through the communications, whether it be a target to engage and put steel on the target, or a complex operation such as moving the forces around on the battlefield.

Without the closure of that complete loop, those activities don't happen, and I think that is what we are trying to do in the C$^3$I budget this year.

### ARMY TACTICAL/AREA COMMUNICATIONS

[Chart No. 7.] Indicated in the tactical area, these are the items contained in that area, Mr. Chairman. Our most important item in the budget this year for the C$^3$I area is the mobile subscriber equipment, and as you will note, there is a considerable increase in the funding profile for that particular item. However, important as well, is the TRITAC equipment supporting the theater commander, the combat net radio to include the MILSTAR SCOTT, and special operations communications for our SOF forces.

### ARMY BATTLEFIELD COMMAND AND CONTROL

[Chart No. 8.] I think equally important is the battlefield command and control which encompasses the integration and interoperability of these various systems you see around that star, if you will, whose information must flow through the communications listed in the middle.

Bringing all this together into one cohesive interoperable system so that the force commander in fact has control of not only the maneuver forces but the fire support forces, the logistics sustainability and the air defense and the IEW is the purpose and intent of the battlefield command and control, and what we are now terming the Army Command and Control System (ACCS).

### RSTA AND IEW

[Chart No. 9.] The reconnaissance surveillance and target acquisition area is another area that has growth and includes most of the sensors that are required to provide the eyes and ears to sense what is going on, including the Joint Stars in which the Air Force has the lead on the platform, the Aquila and TRAILBLAZER, TEAMPACK, TACJAM and additionally, night vision, which provides us the capability to fight at night, which is a distinct advantage that we have.

In the strategic area——

Mr. CHAPPELL. What is TACJAM?

General THOMAS. TACJAM is a jammer that jams in the FM "push to talk" range.

### STRATEGIC/DOD COMMUNICATIONS AND AUTOMATION

[Chart No. 10.] In the strategic area, we support the defense satellite communications area, the WWMCCS, and are funding part of that, the Army's portion; the Regency Net for the ———, the CINC's various plans that they have asked us for; and DLA communications upgrade as well as secure voice programs and others.

### SUSTAINING BASE COMMUNICATIONS AND AUTOMATION

[Chart No. 11.] The sustaining base communications includes posts, camps and stations worldwide. As you can see, two of our critical areas are the Korean fiber optics backbone upgrade, that is being shared in cost with the Korean government, and the digital European backbone system.

In addition, there are switches being installed to modernize the telephone systems in Europe, CONUS and the Pacific; the Worldwide Armed Forces Radio and Television Service; Super Computers to help us with our very exhaustive, intensive calculations in the laboratory environment; and the expansion of Viable to the National Guard and the Army Materiel Command as well as adding the financial system and the civilian personnel system to the Viable network.

### C³I DEFINITION

[Chart No. 12.] Sir, I have tried to explain our request for C³I which we believe is critical to the Airland Battle. It is a force multiplier in what we are doing to ensure that the tremendous weapon systems we are buying today don't get left sitting idle on the side of the next war. I think it means never having to say where should I go or where should I be or where is the enemy, but it means—being able to be at the right place at the right time to win.

I will be glad to answer your questions.

[The slides used by General Thomas during his presentation and his prepared statement follow:]

# COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE

# $C^3I$

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RESEARCH, DEVELOPMENT, AND ACQUISITION
DEPARTMENT OF THE ARMY

16 APRIL 1986

Chart 1

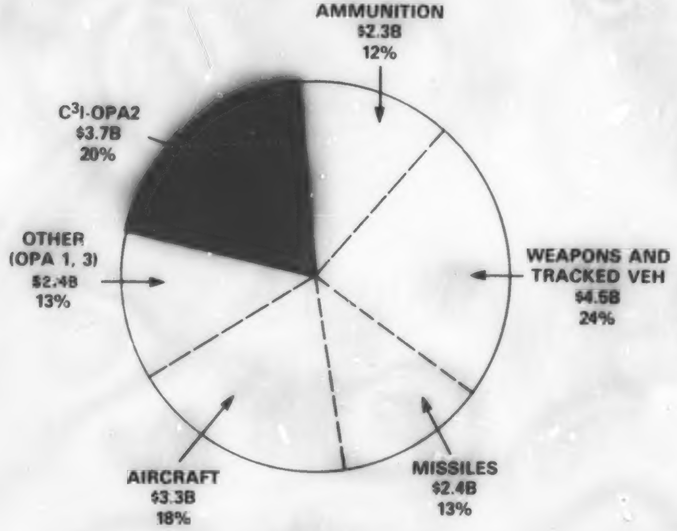
# ARMY COMMAND, CONTROL, COMMUNICATIONS AND INTELLIGENCE — PROGRAMS —

- STRATEGIC — DOD COMMUNICATIONS AND AUTOMATION
- SUSTAINING BASE COMMUNICATIONS AND AUTOMATION
- TACTICAL/AREA COMMUNICATIONS
- BATTLEFIELD COMMAND AND CONTROL
- RECONNAISSANCE, SURVEILLANCE, TARGET ACQUISITION AND INTELLIGENCE/ELECTRONIC WARFARE

Chart 2

# FY 87 PRESIDENT'S BUDGET
# U.S. ARMY PROCUREMENT

($ IN BILLIONS)



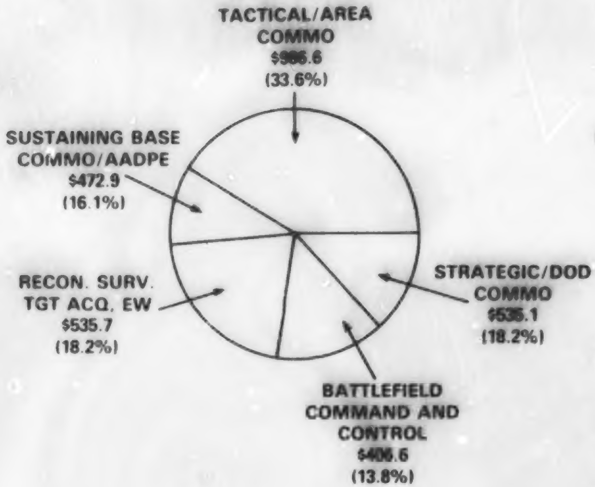
TOTAL $18.6B

Chart 3

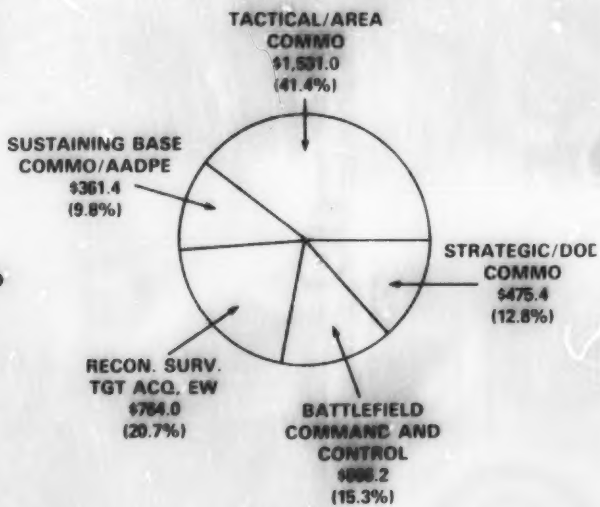
# PROCUREMENT BUDGET COMPARISON

($ IN MILLIONS)

## FY 86 APPROPRIATION



## FY 87 BUDGET SUBMIT



**$2,936.9** + **$761.1** **$3,698.0**

Chart 4

# CORPS COMMANDER'S BATTLEFIELD

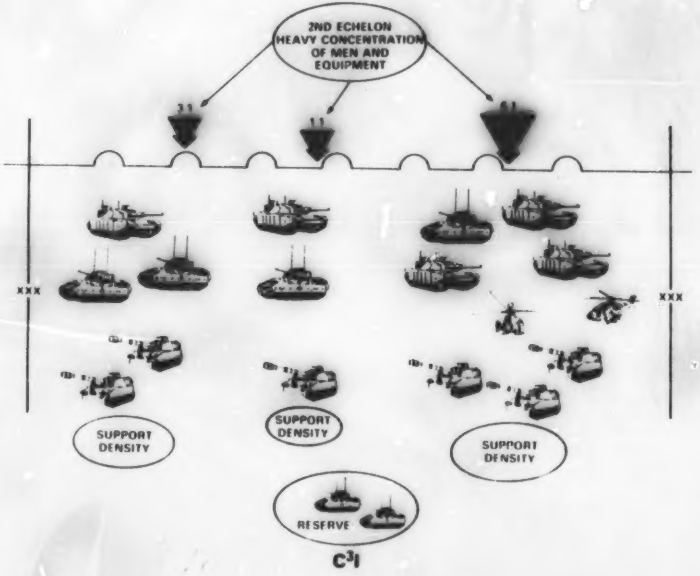
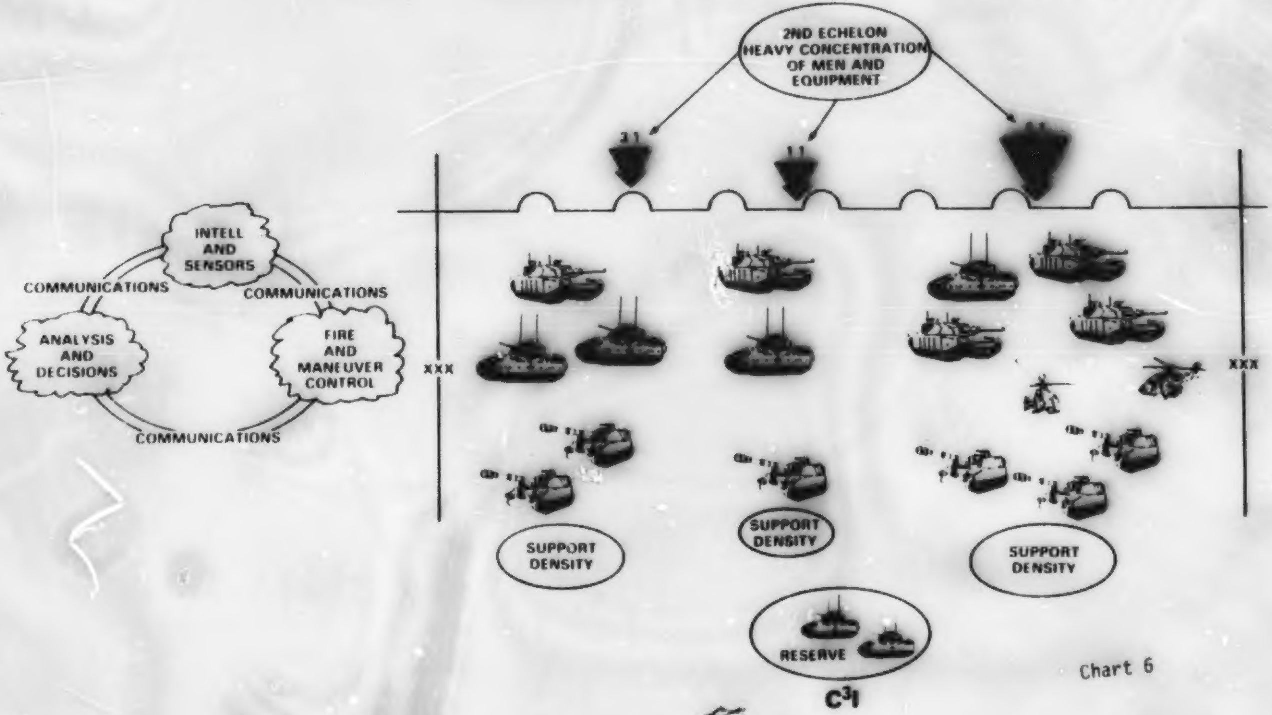

2ND ECHELON
HEAVY CONCENTRATION
OF MEN AND
EQUIPMENT
XXX
XXX
SUPPORT DENSITY
SUPPORT DENSITY
SUPPORT DENSITY
RESERVE
$C^3I$

Chart 5

# ARMY COMMAND, CONTROL COMMUNICATIONS AND INTELLIGENCE

## – SHORTEN THE REACTION TIME –



INTELL AND SENSORS

COMMUNICATIONS

COMMUNICATIONS

ANALYSIS AND DECISIONS

FIRE AND MANEUVER CONTROL

COMMUNICATIONS

2ND ECHELON HEAVY CONCENTRATION OF MEN AND EQUIPMENT

XXX

XXX

SUPPORT DENSITY

SUPPORT DENSITY

SUPPORT DENSITY

RESERVE

$C^3I$

Chart 6

5 49

# ARMY TACTICAL/AREA COMMUNICATIONS

- MOBILE SUBSCRIBER EQUIPMENT
- OTHER TRI-TAC EQUIPMENT
  - SWITCHING
  - TRANSMISSION
  - COMSEC
  - CONTROL
  - TERMINALS
- COMBAT NET RADIO
  - SINCGARS VHF FM RADIO
  - IMPROVED HIGH FREQUENCY RADIO
  - MANPACK/VEHICULAR UHF TAC SAC COMM
  - SCOTT EHF MILSTAR SAT COMM
- SPECIAL OPERATIONS COMMUNICATIONS

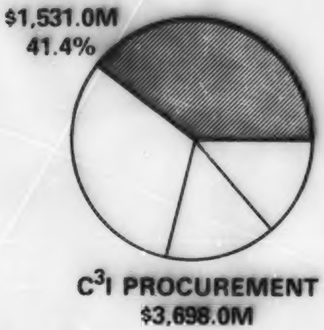
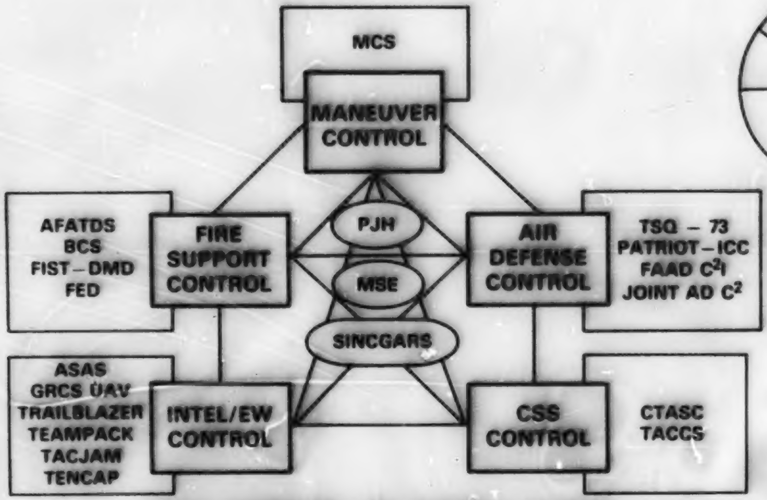


Chart 7

# ARMY BATTLEFIELD COMMAND AND CONTROL



MCS

MANEUVER CONTROL

AFATDS
BCS
FIST–DMD
FED

FIRE SUPPORT CONTROL

PJH

MSE

SINCGARS

AIR DEFENSE CONTROL

TSQ – 73
PATRIOT–ICC
FAAD $C^2I$
JOINT AD $C^2$

ASAS
GRCS UAV
TRAILBLAZER
TEAMPACK
TACJAM
TENCAP

INTEL/EW CONTROL

CSS CONTROL

CTASC
TACCS

ARMY COMMAND AND CONTROL SYSTEM

$C^3I$ PROCUREMENT
$3,698.0M

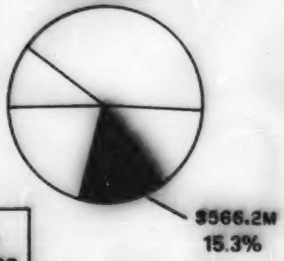


Chart 8

# RECONNAISSANCE, SURVEILLANCE, TARGET ACQUISITION (RSTA) AND INTELLIGENCE AND ELECTRONIC WARFARE (IEW)

- JOINT STARS
- AQUILA RPV
- TRAILBLAZER
- TEAMPACK
- TACJAM
- NIGHT VISION

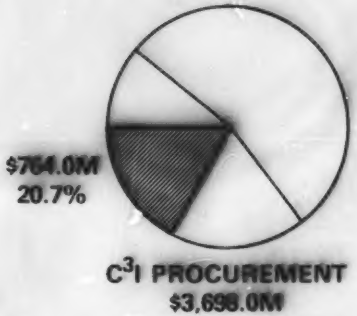
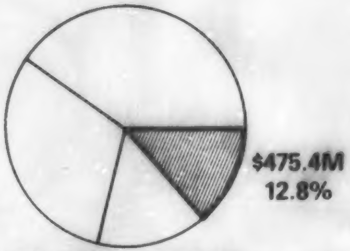


Chart 9

# STRATEGIC/DOD COMMUNICATIONS AND AUTOMATION

- DEFENSE SATELLITE COMMUNICATIONS SYSTEM
- WORLDWIDE MILITARY COMMAND AND CONTROL SYSTEM
- EUCOM $C^3$ AND PACOM $C^3$ REGENCY NETS
- CINC PLANS AND COMM UPGRADES
- SECURE VOICE IMPROVEMENTS
- OTHER DOD PROGRAMS



$C^3$I PROCUREMENT
$3,698.0M

Chart 10

# SUSTAINING BASE COMMUNICATIONS AND AUTOMATION

- TERRESTRIAL LONG-HAUL COMMUNICATIONS
  - KOREAN FIBER-OPTICS BACKBONE TRANSMISSION SYSTEMS
  - DIGITAL EUROPEAN BACKBONE SYSTEM
- BASE COMMUNICATIONS
- PENTAGON TELECOMMUNICATIONS CENTER
- ARMED FORCES RADIO AND TELEVISION SERVICE
- PRODUCTION BASE INVESTMENTS
- SUPERCOMPUTER
- MANAGEMENT INFO SYSTEMS
- VIABLE EXPANSIONS/INTERFACES

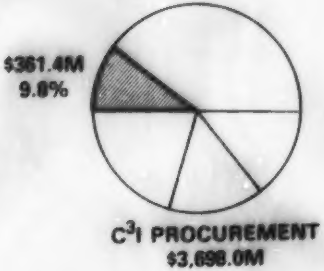
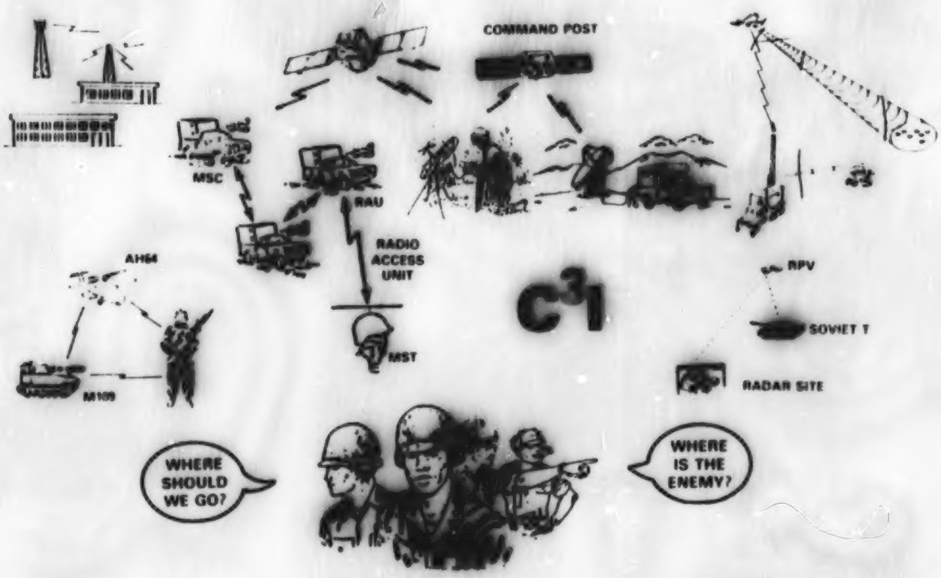


Chart 11


COMMAND POST
MSC
RAU
RADIO ACCESS UNIT
AH64
M109
MST
C³I
RPV
SOVIET T
RADAR SITE
WHERE SHOULD WE GO?
WHERE IS THE ENEMY?

**C$^3$I MEANS**

- **NEVER HAVING TO SAY WHERE?**
- **BEING AT RIGHT PLACE AND RIGHT TIME TO WIN!**

Chart 12

Mr. Chairman: It is a pleasure to provide you and members of the committee, a summary of the Army's Command, Control, Communications and Intelligence (C$^3$I) programs contained in the FY 87 budget request. The Army has a clear vision of the goals it must achieve in order to deter war, and, if need be, to fight and win. Synchronization on the battlefield and strategic capabilities through modernization of our C$^3$I systems is key to meeting our objectives. Our C$^3$I programs contain many critical tasks designed to provide the Army key operational capabilities to win the first battle.

We recognize that the Army C$^3$I procurement appropriations are growing at a faster rate than other Research, Development and Acquisition (RDA) accounts. We have consciously programed funds to enhance our battlefield effectiveness and sustainability, and have consciously focused our resources to develop and procure the equipments which accomplish these objectives.

The Army's C$^3$I procurements are provided in Other Procurement, Army (OPA), Budget Activity 2, Communications and Electronics Equipment. This budget activity provides for:

- o Strategic/DOD Communications and Automation
- o Sustaining Base Communications and Automation
- o Tactical/Area Communications
- o Battlefield Command and Control
- o Reconnaissance, Surveillance, Target Acquisition and Intelligence/Electronic Warfare.

Our FY 87 C$^3$I budget request comprises approximately 20% of the Army's total procurement request. The amounts requested for the five C$^3$I areas are listed in Table 1 and includes the required supporting spares for the individual programs.

TABLE 1

BUDGET ACTIVITY 2
COMMUNICATIONS AND ELECTRONICS EQUIPMENT
FY 87 PRESIDENT'S BUDGET

| FUNCTIONAL AREA | MILLIONS OF DOLLARS |
|---|---|
| Strategic/DOD Communications | 475.4 |
| Sustaining Base Commo/ADPE | 361.4 |
| Tactical/Area Communications | 1,531.0 |
| Battlefield command and control | 566.2 |
| Recon, Surveil, EW, Target Acquisition | 764.0 |
| TOTAL | 3,698.0 |

Strategic C$^3$I programs are among the Department of Defense's top priority efforts and this is reflected in the Army budget request. The Army budget request follows strategic defense guidance. Since the United States has a national strategic policy of protection, rather than attacking, the need for sophisticated C$^3$I is even more important. C$^3$I allows us to quickly decide and act on changing worldwide situations to protect our national interests, those of our allies and of the free world. The Army continues to support its share of these national, DOD and joint service programs.

The FY 87 strategic/DOD communications funding request provides essential modernization, survivability and capacity enhancements to the defense-wide communications systems. It supports the rapid deployment force capabilities enhancements and the CINC'S operational plans and other special programs.

The Army's Sustaining Base Communications and Automation budget request provides essential day-to-day maintenance and modernization of our vital support base. Modernization of Army post, camp and station communications, telephone switching and automation systems directly translate to a more cost efficient and effective peacetime and mobilization sustaining base. The sustaining base also provides productivity and industrial base investments. It provides for training and quality-of-life improvements which have immediate, as well as long term payoffs.

The FY 87 $C^3I$ budget request also represents our efforts to achieve a balanced tactical force. We have carefully analyzed our effectiveness and sustainability on the Airland battlefield. We examined the balance between combat weapons systems and the Other Procurement, Army (OPA) support equipment required to exploit their full range of capabilities. Tanks, artillery, and helicopters are all vitally important to us. However, these combat systems and the soldiers who operate them must be directed to the proper place on the battlefield lest they sit idle or are in the wrong place during the fight. Effective combat also requires us to continually look and listen for signs of the enemy's intentions and to respond with directions which provides us a decisive edge. With it, we can force the enemy to react rather than be proactive as long as we make unexpected deployments. We can make these deployments only if we have a cohesive $C^3I$ network which will provide advance notice of his intentions. The intelligence and communications systems provide the commander the necessary information on which to decide how to properly deploy our combat forces.

The requirements for this balanced force have been translated into the FY 87 budget request and reflect the Army's resolve that $C^3I$ is vital, particularly when we are outnumbered. The realities facing our corps commanders are that each of them will be faced with multiple avenues of enemy approach and can be outnumbered from 2:1 up to 8:1 depending on the approach avenue. His armor, artillery, close air support and combat service support must be allocated to each avenue of approach according to the threat array. The key strategy of the Airland battle includes a reserve capable of swift and undetected maneuver once the combat situation has developed and the enemy's 2nd echelon has been committed. To win against these odds, the corps commander must have a system to reduce his information collection and decision dissemination times to ensure the reserve combat force is committed to the right place at the right time. He will only get one chance.

$C^3I$ is singularly important if we are to fight outnumbered in the conventional sense and win. $C^3I$ serves as a force multiplier in that it allows us to properly fix the enemy, predict his moves, and counter his actions to the extent that he must become reactive to our initiatives.

The tactical intelligence (I) part of $C^3I$ provides us the ability to see beyond the forward line of troops. It is used to tell us "where" the enemy is and "what" he intends to do. It also tells us about the terrain, weather and other pertinent factors concerning his and our environment. Based on the "I" that is gathered through communications, the commander will exercise the command and control of his forces again through communications and thus be properly postured to meet the threat.

In other words, $C^3I$ comprises the sensory and control systems for the battlefield commander. By gathering all of the inputs, the commander can be in the best position to deploy his forces. Of more importance, he can correctly make the critical decisions concerning where and when to deploy his reserve.

The reserve force takes time to be moved. We must screen this movement from the enemy by such means as jamming to deny him the intelligence he is gathering. It is key that a timely and covertly employed reserve be available in the outnumbered scenarios we are likely to face.

In summary, the corps needs swift $C^3I$ "loop closure" and timely actions obtainable only from modern battlefield communications and automation systems. The intelligence senses allow the commander to deploy forces through communications. Although we may be outnumbered the $C^3I$ systems will permit us to react quickly, thus providing the control necessary to win outnumbered.

## TACTICAL/AREA COMMUNICATIONS PROGRAMS

The Army's Tactical/Area Communications Programs are designed to provide essential communications throughout the battlefield in order to exercise effective command and control of U. S. Forces. The Army budget request of $1,531M will procure additional modern, interoperable area communications systems for Echelons Above Corps down to the battalion level of command. These systems include associated data and voice encryption equipment.

In FY 87 we will continue to procure the Mobile Subscriber Equipment (MSE) for corps and below - this is the most important communications system in the FY 87 OPA budget request. The fielding of MSE gives key commanders and principal staff officers a flexible, secure, and mobile communications capability never before achieved on the battlefield. The FY 87 request for MSE will complete the fielding of III Corps and begin fielding V Corps. In addition, the FY 87 budget continues the procurement of other TRI-TAC equipment to support Echelons Above Corps forces.

Combat net radios are an integral part of the total command and control function and are an extension of MSE. These radios are used extensively at platoon through division level. Our principal tactical radio system is the Single Channel Ground and Airborne Radio System (SINCGARS). It will replace the AN/PRC-77, AN/PRC-25 and AN/VRC-12 family of combat net radios which are approaching 25 years of service and are technologically obsolete. SINCGARS provides a very effective electronic counter-countermeasure (ECCM) protection, called frequency hopping. The lack of ECCM protection is a major shortcoming in our current radios. In FY 87 the Army will procure 16,000 SINCGARS radios-sufficient to equip 4 divisions.

Our combat net radio program in FY 87 also includes the continued procurement of Improved High Frequency Radios (IHFR). These high-reliability radios are also built around a common transceiver, and are configured in manpack and vehicular configurations. The Army IHFR is part of the joint program being pursued by all services. Interoperability throughout DOD is ensured. Within the Army, these radios are issued to selected users from Echelons Above Corps through battalion level, based on their requirement for longer-range, non-line-of-sight communications.

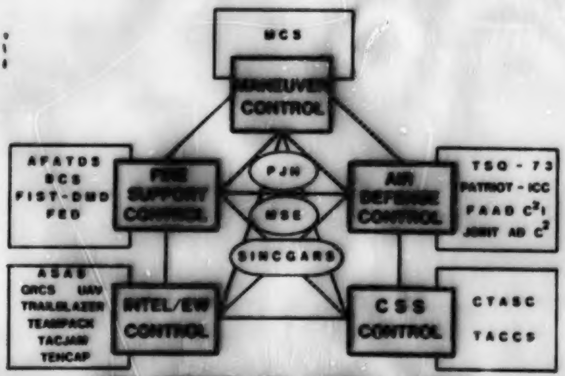
The Army combat net radio family procurement also includes the manpack and vehicular ultra-high frequency (UHF) tactical satellite terminals. The FY 87 request will provide 145 terminals for use by special forces and selected other units within the corps.

Another combat net radio system is the Single Channel Objective Tactical Terminal (SCOTT). SCOTT is the ground satellite terminal of the DOD MILSTAR satellite communications system. SCOTT satisfies a critical theater to division minimum $C^3$ requirements needed for communications in a high jamming and nuclear disturbed environment. It combines the inherent advantages of satellite communications with a sophisticated anti-jam capability and balanced nuclear hardening. SCOTT is currently in full scale engineering development. Production is anticipated in FY 89.

Our Tactical/Area Communications budget request also supports Special Operations Forces (SOF) communications. High frequency radio terminals, electronic maintenance facilities, special liaison communications packages and interfaces to the Regency Net will be procured for the Special Operations Communications Battalion (SOCB). The FY 87 SOF request also procures portable power supplies, hand cranked generators and the previously noted manpack UHF satellite communications terminals. Our FY 87 request also provides an improved low probability of detection and intercept radio communications capability for deployed SOF teams.

## BATTLEFIELD COMMAND AND CONTROL

Battlefield Command and Control is a major tactical $C^3I$ effort in the Army budget request and procures automation and data distribution equipment to support tactical and logistics commanders from corps through battalion levels. The Army's Command and Control System (ACCS) provides the force commander the ability to see and control the entire spectrum of the battlefield. The five functional control nodes of ACCS and the systems of each node are depicted below.



ARMY COMMAND AND CONTROL SYSTEM

These five nodes are provided communications support by (1) the Army Data Distribution System/Position Location Reporting System with Joint Tactical Information Distribution System (ADDS/PLRS/JTIDS), (2) SINCGARS combat net radio, and (3) Mobile Subscriber Equipment. Each functional node will be addressed in turn.

The Maneuver Control System (MCS) provides automated assistance to the commander for collecting, processing and disseminating battlefield information, reports, plans and orders. Deployment of MCS is the key transitional program to evolve to a fully integrated automated ACCS. MCS equipment will be deployed to all the functional nodes. The Army budget request supports a "hardware mix" of fully militarized equipment and ruggedized off-the-shelf equipment. The procurement for the fully militarized version of MCS was completed in FY 86. In FY 87 we will procure only ruggedized commercial Non-Developmental Item (NDI) equipment exclusively and will complete the program in FY 88.

The Intelligence and Electronic Warfare Control System meets the commander's immediate need for an automated system that effectively manages Intelligence and Electronic Warfare (IEW) operations and provides a near real-time picture of enemy activity. The All Source Analysis System (ASAS) is the Army portion of the joint tactical fusion program. Procurement of ASAS will begin in FY 87 to meet that need. Procurement dollars will buy three each limited capability configurations of ASAS for the U.S. Army Intelligence Center and School and two divisions. Battlefield reconnaissance, surveillance, collection and active EW systems supporting the ASAS includes the Guardrail Common Sensor (GRCS), a family of unattended aerial vehicles, TRAILBLAZER, TEAMPACK, TACJAM and TENCAP. Our FY 87 budget request for these supporting systems is described in the Reconnaissance, Surveillance, Target Acquisition, and Intelligence and Electronic Warfare program section.

The fire support control system is the Advanced Field Artillery Tactical Data System (AFATDS) which replaces the TACFIRE system. AFATDS expands and modernizes the automation of fire support function. AFATDS is a fire support $C^2$ system that supports the force commander. Our FY 87 budget request will complete the concept evaluation phase, transport the software to ACCS hardware and continue software development/system integration. Additionally in FY 87, we complete procurement of the Battery Computer System (BCS) for National Guard and Reserve Field Artillery Units. This system automatically computes and transmits individual firing data to each weapon, thereby increasing the speed, accuracy, and effectiveness of artillery fire. In FY 87, the procurement of 381 Fire Support Team-Digital Message Device (FIST-DMD) provides enhanced planning, coordination, and execution capability at the company level for the TACFIRE equipped heavy forces. The FIST-DMD will also be fielded to the light division to provide a viable near-term automated fire support $C^2$ capability. To complete the fire support chain for the light division, we will procure 309 Forward Entry Devices (FED) suitable for the foot mobile forward observer. Both the FIST-DMD and the FED will be retained when the Advanced Field Artillery Tactical Data System (AFATDS) is initially fielded.

The Forward Area Air Defense Command, Control and Intelligence System (FAAD $C^2I$) will continue full scale development efforts in FY 87. FAAD $C^2I$ provides air defense command and control, alerting and cueing for air defense and combined armed weapons, and integration of forward air defense with the maneuver forces. The system consists of non-developmental command and control computers, displays, and peripheral equipment; active and passive sensors, and identification systems. The program is built around the program formerly called SHORAD $C^2$. Initial production is planned for FY 88. FAAD $C^2I$ provides a fully integrated, automated tactical air defense command, control and intelligence capability in the forward area of the battlefield.

In the combat service support arena, other tactical Automatic Data Processing Equipment (ADPE) systems are being fielded to automate and speed medical, supply, maintenance, transportation and personnel support functions. The Tactical Army Combat Service Support Computer System (TACCS) and the Corps/Theater ADPE Service Center (CTASC) provide an overall automated assistance capability to the vital logistics functions required to support the battle.

At higher levels, the Corps/Theater ADPE Service Center (CTASC) provides standard transportable computer hardware to perform consolidated type processing for Standard Multi-Command Management Information Systems (STAMMIS) at corps and theater levels. These systems provide automation support to a variety of functional areas; i.e., supply, maintenance, property accountability, and financial management. In FY 87, a contract will be awarded to procure an additional 6 CTASC's for USAREUR, CONUS, WESTCOM and IX Corps.

Tactical Army Combat Service Support Computer System (TACCS) is a ruggedized, two-man transportable, user-friendly microcomputer system used on the battlefield for the combat service support missions of personnel, supply, maintenance, medical, ammunition and transportation. In FY 87, TACCS will be procured for fielding to 11 divisions.

The principal communications for near real-time battlefield automation is provided by the Army Data Distribution System (ADDS) -- a tactical data system composed of Enhanced Position Location Reporting System (EPLRS) equipment and Joint Tactical Information Distribution System (JTIDS) terminals. ADDS will provide the Army with a reliable, jam resistant, high speed computer-to-computer data communications system to significantly improve command and control for the fire support, air defense, and intelligence/electronic warfare functions within the Army Command and Control System (ACCS). FY 87 completes the two year pre-planned product improvement program to enhance PLRS production equipment to the final ADDS configuration.

Our FY 87 budget request will initiate JTIDS Class 2 terminal procurement. This procurement supports fielding of ADDS for two Army divisions. The ADDS/PLRS/JTIDS system also provide an inherent position location and reporting capability. This position and navigation (POS/NAV) information is displayed to each user, other like-equipped users and control stations to synchronize movement on the battlefield.

Two other battlefield $C^2$ systems provide critically required position and navigation capabilities. These highly accurate and responsive systems are key to reducing our battlefield reaction times. The Position Azimuth Determining System (PADS) provides fire support systems the necessary position accuracy to achieve accurate first round unobserved fire. Procurement of PADS will continue in FY 87. PADS is a reliable, self-contained inertial survey device which provides the requisite accuracy for position and direction. PADS is also used to update and validate data for less accurate position/navigation systems. The 107 PADS in the FY 87 budget request will complete fielding of the active force and begin fielding to the National Guard and Reserve Units.

In addition to these two POS/NAV systems, the Army will selectively deploy vehicular and airborne Global Positioning System (GPS) Units. The GPS is a joint, Air Force lead program. GPS is a space-based navigation, positioning and time distribution system designed to provide precise, continuous, all-weather, common grid, worldwide navigational and timing information to land, air, sea and space-based users. Our FY 87 request supports the Tri-Service low rate initial production.

## RECONNAISSANCE, SURVEILLANCE, TARGET ACQUISITION (RSTA) AND INTELLIGENCE AND ELECTRONIC WARFARE (IEW)

Our request for Reconnaissance, Surveillance, Target Acquisition (RSTA) and IEW equipment includes funding for systems essential to the location and identification of targets on the battlefield which support close-in fire support and deep battle targeting.

The prime RSTA system which is being developed jointly with the U.S. Air Force is Joint STARS - a battle management and targeting system which detects, locates, tracks, classifies and assists in attacking both moving and stationary targets beyond the FLOT. Dedicated to the land component commander, it is an "electronic high ground" which provides a common and coherent view of the battlefield. The Air Force is the executive service for the prime mission equipment. As the participating service, the Army is responsible for the Ground Station Module (GSM), which is a data processing and distribution system. The FY 87 budget request supports procurement of 9 GSM'S.

The AQUILA remotely piloted vehicle will enhance the effectiveness of field artillery beyond the forward line of troops by providing target acquisition, conventional artillery adjustment and laser designation for "smart" munitions. The system is designed to perform its missions and survive in a highly intense enemy environment characterized by intense electromagnetic countermeasures and air defenses where the risk to manned aircraft would be high. The Army's budget request will buy an operational battery set of AQUILA hardware.

The need to quickly identify and locate enemy tactical command posts, fire direction centers and troop staging areas in a fast moving combat scenario is well known. Also well known is the need to be able to deny him the use of the communications associated with these elements. For the ground tactical commander this is accomplished through our intelligence locating and jamming systems. Our FY 87 budget request includes funds for two division sets of TRAILBLAZER, 4 division sets of the AN/PRD-10 manportable direction finding equipment and 5 divisions sets of TACJAM. These electronic "listening and fixing" capabilities coupled with the search, look-down, report back and target designation capabilities of the AQUILA remotely piloted vehicle provide the division and corps commanders the capability to react quickly to the enemy's actions.

The Army's ability to win while outnumbered requires a night fighting capability. The Army's FY 87 budget request of $63.2 million will procure over 18,000 night vision goggles/sights and direct night vision support and maintenance equipment as part of the five-year multi-year omnibus contract (FY 85-89). This omnibus contract will yield increased quantities of urgently needed night vision devices which will enable the Army to own the night fight.

## STRATEGIC/DOD COMMUNICATIONS

Our Strategic/DOD Communications FY 87 budget request encompasses those programs which provide unique and vital command and control capabilities primarily from the National Command Authority to the commander-in-chief levels. Our FY 87 request of $475.4m continues Army support to the Defense Satellite Communications System (DSCS), the Worldwide Military Command and Control System (WWMCCS), EUCOM and PACOM Regency Nets and other DOD sponsored programs.

The funding for the ground segment of the Defense Satellite Communications System executes our assigned responsibilities in Joint and DOD C3I programs. Modernization, expansion and increased survivability are key in this program. Our FY 87 program will provide more automatic, survivable and effective control systems for the DSCS. Modernization will continue in the digital communications and supporting subsystems.

The Army WWMCCS Information System (AWIS), a part of the larger joint WIS program, is implementing a phased modernization and expansion effort for automated data processing and telecommunications capabilities. Besides modernizing the hardware and software, the underlying information reporting systems and procedures are being analyzed and improved to meet national priorities for worldwide military command and control. It also enhances national crisis management capabilities of military forces worldwide. Our FY 87 budget includes this development and the procurement of automated message handling systems for 4 Army sites.

The FY 87 funding for EUCOM $C^3$ and PACOM $C^3$ (Regency Nets) will procure approximately 40 percent of the total terminals required. The Regency Net provides critical command and control communications for rapid, secure dissemination of emergency action messages.

## SUSTAINING BASE COMMUNICATIONS/ADPE

The final major area of $C^3I$ is the sustaining base communications/ADPE which funds those essential non-tactical equipments required to effectively maintain the sustaining base for tactical and strategic forces. Our request includes funding for the continued modernization and expansion of the terrestrial long-haul communications systems including installation of a fiber-optic backbone transmission system in Korea. The cost of this system is shared with the Government of Korea. The addition of a bulk encryption capability, and conversion from analog to digital microwave transmission in the Digital European Backbone (DEB) system will also be provided.

Our FY 87 request for BASECOM will purchase new state-of-the-art digital telephone switching systems for seven Army sites worldwide, as well as to upgrade their cable plant facilities. This modernization will greatly improve the efficiency of the day-to-day operations of our sustaining base. In addition to improving service, continually rising maintenance costs of the antiquated systems will be eliminated.

Our sustaining base ADPE programs include various initiatives to increase the productivity of Army operations. These initiatives range from expansion of the Standard Army Automated Contracting System (SAACONS) for installations management information systems for headquarters and commands throughout the Army, to procurement of a supercomputer.

Our FY 87 budget request will support initiation of equipment upgrades to the Vertical Installation Automation Baseline (VIABLE) network to accommodate the redesign of the Standard Finance System (STANFINS). VIABLE network provides installation commanders a modern interactive data processing capability for accomplishing daily information management of the business functions of personnel, force accounting and supply. The FY 87 request will provide additional VIABLE network facilities to 14 sites in Europe an 9 Army Materiel Command Installations throughout CONUS.

## SUMMARY

In preparing the FY 87 budget request, the Army has continued to place emphasis on a balanced combat ready force which can fight effectively and sustain itself on the battlefield. Our request reflects the need to provide reliable, modern command, control, communications and intelligence capabilities and includes emphasis and proper resourcing of the strategic and a balancing of the tactical force structure. The FY 87 increases in Other Procurement, Army reflect the importance of $C^3I$ to deter war or, failing that, to fight and win.

Sir, this concludes my review of the Army's Command, Control, Communications and Intelligence FY 87 budget request. I look forward to responding to your questions.

## MOBILE SUBSCRIBER EQUIPMENT

Mr. **CHAPPELL**. The budget request for the mobile subscriber equipment program in fiscal year 1987 is $903.7 million, or about one-fourth of the $3.7 billion requested for all Army communications and electronics equipment.

Furthermore, the $568 million increase over fiscal year 1986 for MSE is 75 percent of the increase for all Army communications and electronics equipment. Obviously, this level of funding has high visibility in a stringent budget year.

### RANGES FOR MSE CONTRACT

What is the range of production quantities and funding amounts allowable for the fiscal year 1987 option for procurement of MSE equipment?

General **THOMAS**. Mr. Chairman, the contract for MSE includes three ranges: the A range, which is the low range; the B range, which we are now programmed and requested funding for, which is the middle range and is the five-year program we have discussed before; and the C range, which is an accelerated range.

The $903 million that we have requested this year provides us with the lowest level in the B range of the MSE contract. We have requested $903.7 million. Contractually, $878.6 of that would be on contract.

If, for example, we dropped into the A range, the penalty in fiscal year 1987 is the largest of any of the years and is a sliding penalty, but its average is 16.7 percent.

If we revise the contract downward by $32 million, we would forfeit one division signal battalion worth of equipment and one corps support battalion worth of equipment, which are valued at $140 million. So by decrementing this by $32 million into the next range, we lost $140 million worth of equipment.

Mr. **CHAPPELL**. What does that mean to the unit cost?

General **THOMAS**. The unit cost would increase significantly if we do go into the A range or the low range: the contract is written such that this schedule for 1987 plus all succeeding year schedules are now subject to renegotiation. So we would have to renegotiate the production and fielding schedule for this contract.

### MSE/COMPUTER SYSTEMS

Mr. **CHAPPELL**. How will the MSE be used in connection with the numerous computer systems now being developed to assist in battlefield functions and air defense intelligence?

General **THOMAS**. MSE will be a carrier for many of the Army command and control systems along with the PLRS/JTIDS hybrid. Those are the two principal carriers of the many Army command and control systems which I showed previously, those which require a time sensitivity of greater—of longer than ten seconds so that you can still accomplish your mission if it takes ten seconds to move the information from point A to point B, then those are candidates for transmission over MSE and the interoperability has been defined for that.

If they are to be moved in less than ten seconds, for example, one of our critical areas is air defense, if it is less than ten seconds, then we plan for them to move over the PJH system.

Mr. **Chappell**. Will MSE require improvements or modifications in order to support these systems?

General **Thomas**. Sir, we have no current plan or funded modification for MSE for that, and the basic concept is that we have a definition of the interoperability and the specifications of MSE which is compatible with what we have been planning before, and all of these systems will be interoperable with this.

Mr. **Chappell**. So they are pretty mature?

General **Thomas**. Yes, sir.

### GENERATORS

Mr. **Chappell**. The Army is now beginning to replace its old family of generators with generators that are quieter, blast and electromagnetic pulse (EMP) hardened, less likely to produce a heat signature for infrared-seeking missiles, and more reliable.

The committee understands that the generators that are planned to be acquired in the MSE program are from an old family. Is that right?

General **Thomas**. Sir, that was the identified generator in the bid by GTE. They are required to meet the performance specification of that generator.

My latest information is that they are negotiating with a subcontractor for the specific generator that will meet those minimum specifications.

It may well be that generator, yes, sir.

### EMP THREAT

Mr. **Chappell**. Is MSE otherwise a fully militarized system? Does it have a capability of withstanding the threat envisioned for its area of operations on the battlefield?

General **Thomas**. We feel that it is. Of course, you always have the case that our vehicles aren't EMP hardened, so if you get that, you have communications gear that works which you can't move around. But it is hardened to the EMP threat, and it also, by its very nature of the network of 44 switches per corps and the flood search algorithm resident in the MSE, which means it searches all routes simultaneously, has a survivability greater than anything we have seen before.

Mr. **Chappell**. What about the interim? How are you going to handle the interim?

General **Thomas**. We are staying with what we have in the interim, sir, and that is why we feel that the five-year fielding of MSE is critical to us.

We have terminated the procurement of any other systems.

### MSE SCHEDULE

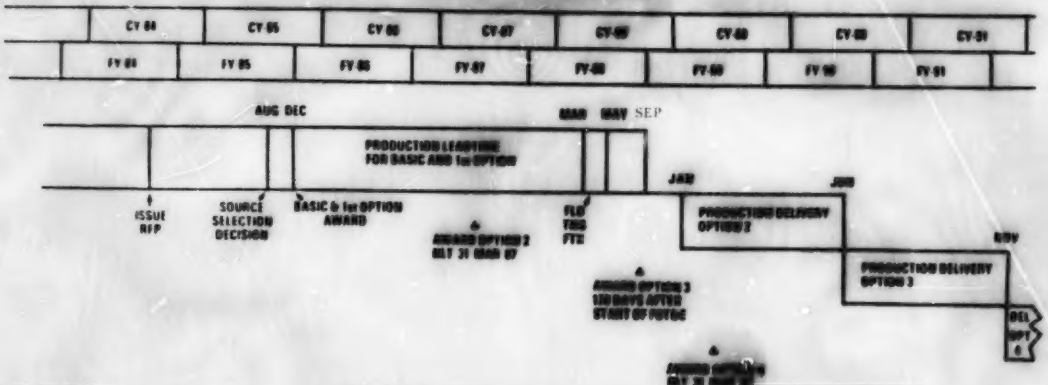
Mr. **Chappell**. Delays in awarding the MSE contract caused commensurate delays in testing and fielding schedule.

Please put in the record a detailed revised schedule for testing, procuring, and fielding MSE equipment.

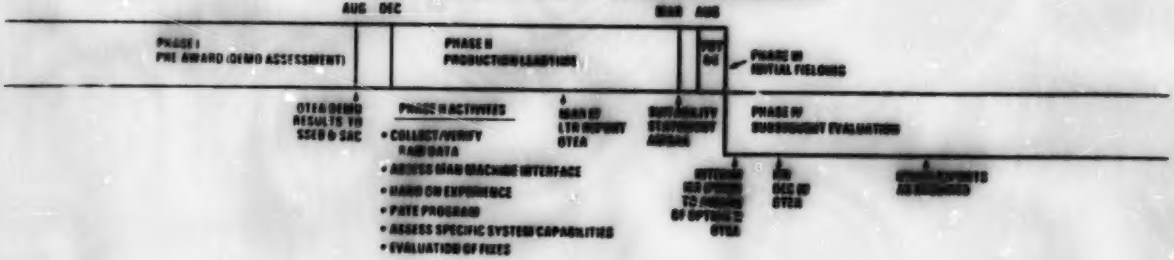
[The information follows:]

Following is a detailed revised schedule for testing, procuring and fielding MSE equipment.

## MSE OVERVIEW SCHEDULE



## MSE OPERATIONAL EVALUATION SCHEDULE



## MSE GENERATORS

Mr. **Chappell.** Mr. McDade.

Mr. **McDade.** I want to take you back to a comment you made to the Chairman about the system to back up the mobile subscriber units. It is my understanding that you informed the committee that you were going to use the dollars available to supplement the same generators now on line, is that right?

General **Thomas.** I am not sure——

Mr. **McDade.** Buy the same kind of generators that you now have for MSE.

General **Thomas.** In the MSE contract, sir, there is no GFE in that contract. The contractor must do the procurement of all vehicles, generators, telephones, et cetera, in that contract.

So we have decremented our generator line and our truck line on the normal GFE, and our request in the budget process is to accommodate the fact that GTE is providing 100 percent of that.

Mr. **McDade.** Do you think GTE is going back and getting the same kind of generators that we have in the system now?

General **Thomas.** They could very well be, yes, sir.

Mr. **McDade.** It is a fact, isn't it?

General **Thomas.** Sir, I don't know that that subcontract has been locked in.

Mr. **McDade.** Good. I hope it isn't, and we would like to hear back from you sometime today or tomorrow through the staff.

We had a long discussion about the ineffectiveness of the generators that were being furnished to the Army. They are the loudest things on earth, unreliable, and in fact you usually put two out instead of one because of the unreliability factor.

General **Thomas.** On the gasoline generators, yes.

Mr. **McDade.** It is contraditory to have a billion dollars in the budget to get the mobile subscriber and back it up with an old generator that is too noisy, and has too much of an IR signature; it doesn't make sense.

General **Thomas.** I will determine the details and get back to you on that.

[The information follows:]

No. The Army is not procuring the old family of generators. The MSE contract requires that GTE provide PU-753 (10KW diesel) and PU-751 (5KW diesel) generators or generators similar in performance. While these generators are not the "quiet" generators we are producing off-the-shelf for our Command Posts, neither are they the "old, unreliable, gasoline generators" which we have with our communications equipment in the field today. We are satisfied with the current MSE contract and the actions of the contractor in obtaining the best possible generator for our MSE systems.

## Single Channel Ground and Airborne Radio System (SINCGARS)

Mr. **McDade.** In fiscal year 1986, Congress reduced the budget request for SINCGARS by $120 million because the Army advised that it was not proceeding with the next procurement option. The committee understands the contractor is now about one year behind schedule and that reliability problems persist.

Is that true, General?

General **Thomas**. Yes, sir, that is true. As you know, we offered to rebaseline the program during the mark last year to reduce that money. Last Monday, Mr. Ambrose, General Wagner and I and a few other people met with Mr. Carpenter, the President of ITT corporate headquarters, and his members. They have committed to fix the reliability problem.

In fact, if I may, they have increased the reliability staff as of last Monday by 35 people who they consider to be experts within and outside the company.

They are contracting for two independent contractors, one to assess reliability and the second to assess manufacturing processess and producibility.

They have initiated a test analyze fix program. A rigid program to fix that on an accelerated basis. They are committing a considerable amount of capital investment and people talent to fix this program.

Nonetheless, the program is behind schedule on reliability.

### NDI OPTION

Mr. **McDade**. Is there an NDI option in the package?

General **Thomas**. There are hopping radios available off the shelf. One limitation on that is that in the selection of ITT as a contractor, we established the de facto frequency hopping wave form for DoD, and that became the standard, not only in the SINCGARS ground radio, but in the airborne and shipborne radios.

The Navy currently has a contract with Collins that employs the ITT frequency hopping wave form. The Air Force currently has a contract with Cincinnati Electronics with that same wave form, which are modifications to some of their existing radios, so we will be interoperable and compatible.

In going out on the NDI market, there are no hopping radios out there that have that wave form, so—it is not a free lunch NDI approach. There would be engineering required.

Mr. **McDade**. It isn't really an NDI item?

General **Thomas**. It would have to be a product improvement to an NDI item of some magnitude.

Mr. **McDade**. That is not my conception of NDI. Is it yours?

General **Thomas**. No, sir.

### SINCGARS DEPLOYMENT

Mr. **Chappell**. What are we talking about, up to battalion level for this?

General **Thomas**. For the SINCGARS radio deployment, its predominant mode of employment is battalion and below.

Mr. **Chappell**. This is a communications network that comes down to the soldiers in the field, right?

General **Thomas**. Yes, sir, this is the push to talk carried on your back and in your vehicle radio short-range line of sight. It replaces our VRC-12 and, as you know, we are short FM radios, which is one of our readiness items right now, so we are wrestling with that issue. We want it brought along as fast as possible, I can guarantee you that.

Mr. **Chappell**. Thank you, Mr. McDade.

## RELIABILITY CRITERIA

Mr. McDade. The Army reliability criteria is 1250 hours mean time between failure. It is our understanding the contractor has requested that that standard be lowered. Is there such a request?

General Thomas. Sir, in our meeting last Monday, that was not mentioned. I understand at a different level where the contract negotiations are going on that that has been requested.

Mr. McDade. Do you know if there has been a response by the Army?

General Thomas. To date we have not agreed to lower that meantime between failure and in fact our position is that the engineering change proposals required to meet that, the cost will be borne by the contractor. We are on a firm, fixed-price contract.

Mr. McDade. I heard you say you are not going to change the standard, is that right?

General Thomas. As of right now, our intent is not to change the standard, but I can't—

Mr. McDade. What is the problem?

General Thomas. Sir, the problem, very simply, is that we are short VRC-12 radios and it is a readiness item in the field today. We have a choice how far we delay accepting any radios at all and go short and accepting some possibly below the 1250 with some type of warranty or some arrangement that might be worked out there, and that decision simply hasn't been made yet.

I don't think we are at the point of making that decision yet.

Mr. Chappell. How hard are you pursuing this thing, General?

## SECOND SOURCE

General Thomas. We are pursuing it very hard. Mr. Ambrose was at the plant on 6 March. The ITT president was in last Monday. They are committed to coming back to us in three weeks with results of what they have accomplished as well as a solicitation for a second source, which we want to bring on very quickly.

Mr. Chappell. Was this competed?

General Thomas. Yes, sir, it was competed.

Mr. McDade. You mentioned, didn't you, that to your knowledge the Navy was being supplied by Collins, I think, and the Air Force has another supplier?

General Thomas. Cincinnati Electronics, yes, sir.

Mr. McDade. Doesn't that offer you some opportunity in dealing with this problem?

General Thomas. Sir, there is a hopping applique to an existing radio as opposed to a total radio, so to the extent that their engineering knowledge is in the hopping aspect of that, yes, it does, but to the extent that they can marry that up with a ground radio in a package, that is also an engineering effort.

I would like to say, sir, that we want a second source brought on very quickly, and in fact the 1986 appropriation is for a second source; no money there for ITT. We have stopped all progress payments on this.

ITT has committed to come back to us with a second source in three weeks, an new source plan, which would provide the second source competition not at the exact design that ITT has, but at the card level, so that the competer, if you will, the competitor, could use their own design capability and they may get into production first, and it provides more of a horse race in this game as opposed to us being locked in totally to ITT.

### PROCUREMENT

Mr. **McDade**. We have been informed, and perhaps you can verify it, that there was a request to lower that standard to about 600 or thereabouts. The request came from the contractor. And that request was denied. Is that an accurate statement?

General **Thomas**. Yes, sir, that is an accurate statement.

Mr. **McDade**. Given all this problem, how can you justify continuing the budget plan to contract in January 1987 for $204 million to buy 16,000 radios?

General **Thomas**. Sir, the 1987 procurement is a result of already a slip from 1986 to 1987; it was pushed back. If we did not provide the money for the option in fiscal year 1987, which is the first year of full-rate production, for ITT of a three-option year, full-rate production, then I am concerned that we would be in a position of having to renegotiate the firm fixed price on the three full-rate production years, and would lose whatever advantage we have.

### CONTRACT COMPLIANCE

Mr. **McDade**. General, the product you are getting is not reliable; isn't that what we have learned?

General **Thomas**. Sir, we don't intend to accept it until we get reliability that meets what we want.

Mr. **McDade**. Why did you have to renegotiate the whole contract? I don't understand that.

General **Thomas**. If the government, by virtue of not budgeting the money, takes the money away before they have proven that they cannot meet that at that particular time frame, then we are the cause of that break rather than the company being the cause of that break.

Right now they are scheduled to have a follow on test and evaluation (FOT&E), in February of 1987, and if they don't make that, we are into a different ball game, but if we were to take the money away, that will be different.

Mr. **McDade**. Well, we sure can't fence it subject to their compliance with the contract.

General **Thomas**. Sir, we would be glad to—

Mr. **Chappell**. When are they supposed to fix it? What does the contract say about that?

General **Thomas**. Sir, the contract right now—they are in noncompliance with the contract on schedule.

Mr. **Chappell**. Well, if they are in noncompliance now—

General **Thomas**. Yes, sir.

Mr. **Chappell**. I don't understand what you are talking about on a renegotiation of the contract. If they haven't met it now, what kind of time limit would you give tham on a renegotiated contract?

General **Thomas**. We are attempting in the negotiations now. We are attempting to negotiate an adjusted time schedule and delivery schedule with the actions which they are taking out of pocket, as I mentioned, which would put them back into production on the timetable, on this one-year slip we have talked about, which is the way we are lined up right now.

### PRESENT EQUIPMENT

Mr. CHAPPELL. What kind of equipment are we using now?

General THOMAS. Sir, we are using the VRC-12 series radios in the field today, which do not have the hopping capability or the antijam capability in that, and those radios have been out there since the late 1950's early 1960's, and their meantime between failure is somewhere less than 200 hours.

I would say, after being present at Monday's meeting, I think ITT is committed to make this work and to accelerate the process, and commit it out of corporate funds to make it work and meet the contract. That is my impression. I did not have that impression until Monday, I might add.

Mr. CHAPPELL. In any event, you are going to be another year or so getting this straightened out, right?

General THOMAS. I would say that the earliest we are talking about having something straightened out in there is what we will find out in an FOT&E in February 1987, which has been slipped, yes, sir.

### CONTRACTOR DEFAULT

Mr. McDADE. It seems to me that when you have a contractor in nonperformance, and that is what we have, a contractor not giving you a reliable piece of equipment, you have a reliability standard in the contract, don't you?

General THOMAS. Yes.

Mr. McDADE. He is not meeting that, is he?

General THOMAS. No sir.

Mr. McDADE. He is testing components, isn't he, now?

General THOMAS. Sir, he has full radios he has built.

Mr. McDADE. Would you put in the record the specifications that the contractor has suggested to make the radio acceptable. It seems to me as I sit here and listen to the problem, and I realize it is a problem for you, that there are an awful lot of reasons for us to default the contractor rather than the other way around.

[The information follows:]

The contractor's current assessment of the reliability which is achievable in the near term is 600 hours Mean Time Between Failure (MTBF). This proposal is unacceptable. It is the intent of the Army to work with the contractor to obtain radios which meet Army operational requirements and the contract specification which is a demonstrated minimum MTBF of at least 1250 hours.

Mr. McDADE. I don't see why we should appropriate a penny for this when he is in default. He is not meeting reliability standards, is he?

General THOMAS. No, sir, he is not.

Mr. McDADE. He hasn't met delivery schedules, has he?

General THOMAS. No, sir, he hasn't.

Mr. McDADE. I think that is a contract in default and the reason I suggest that to you is because we have a lot of hard budget decisions to make this year. Here is a program that appears to be in very serious trouble due to the contractor, and as we look at it, and hear your testimony that he might have some cause of action if we were to take the money out, I wish you would look at that again, because it seems to me he has defaulted the contract.

I haven't practiced law in a while, but I think I would take this case.

General THOMAS. There is no question that there was a technical default of the contract when he didn't meet the schedule of reliability to start with.

Mr. McDADE. You have notified him of that?

General THOMAS. Yes, and we have stopped paying progress payments, so we are not paying anything. He is having to pay out of his pocket now.

Mr. CHAPPELL. You are not going to reduce the standards, are you?

General THOMAS. Sir, right now we have no intention of reducing the standards.

### MOBILE SUBSCRIBER EQUIPMENT MAINTENANCE

Mr. McDADE. On another subject, back to MSE, what is the maintenance concept for MSE?

General THOMAS. The maintenance concpet for MSE is to—first of all, there will be bit byte in the equipment itself that is provided, and I am talking now on the MSE electronic aspect, not the vehicles and so on. And that will be backed out with one level of maintenance which in this case has—will provide test set equipment for basic go/no-go testing at the LRU level, and then that would be DX'd or direct exchanged back through to the contractor and the contractor in the initial stages of the contract will provide the maintenance from the echelon above corps and depot level, intermediate rear, we call it, back. The contractor will provide that.

At such time as we feel that it is more cost effective for us to cut that in, then we will look at that and do that, to take over that role.

Mr. McDADE. I am trying to find out who is going to do the maintenance on the MSE and where you are going to do it.

General THOMAS. In the depot level?

Mr. McDADE. Yes.

General THOMAS. The depot level maintenance will be done by GTE.

Mr. McDADE. You are intending to contract that part of it out?

General THOMAS. Yes, sir.

Mr. McDADE. Why?

General THOMAS. First of all, the cost of training all the necessary green-suit folks to do that, the cost—

Mr. McDADE. In the depots? You are not going to train green suiters in the depot, are you?

General THOMAS. In the depots we have green suiters and civilians.

Mr. McDADE. In some cases, the depot system isn't running at full gear, is it?

General THOMAS. I can't speak to every depot, sir.

Mr. McDade. I think you better go back and contact the staff and let us know about the intentions. We are very interested in finding out whether you intend to give us a contract or have it done in the depot system, and we need to know very precisely.

[The information follows:]

GTE will establish and operate a total of 5 Regional Support Centers (1 for each Corps) to provide both supply and maintenance service. GTE will fill supply requisitions for MSE unique consumables. GTE will also be responsible for depot repair of all MSE unique items.

Army maintenance depots will be responsible for depot maintenance of the following MSE equipment.

a. Generators and associated power equipment
b. HMMWV's
c. Air Conditioners
d. COMSEC
e. Family of Digital Group Multiplex Equipment
f. Teletype AN/UGC-74's
g. SB-3614 Switchboards (Marine Corps)
h. Test Equipment
i. Portions of Node Central Switch

GTE is responsible for maintaining the following MSE unique equipment:

a. Telephones
b. Radio multiplex equipment
c. Facsimile UXC-7
d. Central Processing Units
e. SHF Radios
f. Line of Sight Radios
g. Mobile Subscriber Radio Terminal
h. Large Extension Node
i. System Control Center

Depot requirements to rebuild communications equipment being displaced and reutilized at Echelons Above Corps will increase significantly during the FY87–91 time period. The rebuild of this equipment more than offsets the contractor maintenance of MSE and is urgently required to meet the priorities listed below:

| Priority | Destination | Timeframe |
|---|---|---|
| 1 | Other Army units | 1988–1991 |
| 2 | War reserves | 1986–1986 |
| 3 | Foreign military sales | 1991–1995 |

Mr. Chappell. General, thank you. We have some additional questions to be answered for the record.

[Clerk's note.—Questions submitted for the record and the answers thereto follow:]

ADVANCED FIELD ARTILLERY TACTICAL DIRECTION SYSTEM (AFATDS)

Question. The Fiscal Year 1986 Appropriations Joint Conference provided $25.5M in procurement for the urgent Light Division requirements. Army is required to submit a new program plan by August 1, 1986. Will the plan comply with Congressional direction to provide the Light Divisions with a capability suitable for low and high intensity conflicts?

General Thomas. Yes, the Army plan will provide the Light Divisions with a near-term capability suitable for low intensity conflict. This near-term capability also has the potential for enhancement through software additions and low cost hardware modifications. AFATDS is the only system, planned or available, that is suitable for high intensity conflict.

**Question.** Is it reasonable to assume that the Light Divisions might fight side by side with the heavy divisions? If so, will the automated systems being fielded with the Light Divisions be completely interoperable with the fielded systems of the heavy divisions?

General **Thomas.** Yes, it is reasonable to assume that the Light Divisions will fight along side of the Heavy Divisions. The capability being provided to the Light Divisions is completely interoperable with the fielded systems of the Heavy Divisions.

**Question.** The following questions refer to the Army's September 1985 Modified Plan: The plan indicated that fielding would begin to the first two Light Divisions in the 4th quarter FY 86. When do you expect fielding to begin now. Will the Light Divisions be fielded with FIST DMD's prior to the Heavy Divisions? Provide a detailed schedule indicating what equipments will be fielded to what divisions, and when fielding will begin and end.

General **Thomas.** Army expects to start fielding the FIST DMD to the Light Divisions in 1QFY87. Unit fielding will begin with the 24th ID (Heavy Division) and then to the Light Divisions and other Heavy Divisions depending upon their priority. The proposed FIST DMD distribution order of precedence, proposed fielding dates, BCS fielding status and proposed DCT quantities and fielding dates are as follows:

| Unit | Fist DMD | BCS | DCT |
|---|---|---|---|
| A USAFAS (TRADOC) | 3QFY86/24 | | |
| B 24TH ID (FORSCOM) | 4QFY86/59 | | |
| C USAFAS (TRADOC) | 4QFY86/27 | | |
| D 7TH ID (FORSCOM) | 1QFY87/21 | | 1QFY87/125 |
| E 82ND ABN (FORSCOM) | 1QFY87/21 | | 1QFY87/125 |
| F 25TH ID (WESTCOM) | 1QFY87/21 | | |
| G 10TH ID (FORSCOM) | 1QFY87/21 | 4QFY86 | |
| H 1ST ID (FWD) (USAREUR) | 1QFY87/17 | | |
| I 101ST AASLT (FORSCOM) | 1QFY87/21 | | |
| J 7TH ATC (USAREUR) | 2QFY87/8 | | |
| K 2ND AD (FWD) (USAREUR) | 2QFY87/16 | | |
| L USAFAS (TRADOC) | 2QFY87/24 | | |
| M 1ST AD (USAREUR) | 2QFY87/61 | | |
| N 6TH ID (FORSCOM) | 3QFY87/23 | 1QFY87 | |
| O 3RD AD (USAREUR) | 3QFY87/61 | | |
| P BERLIN BDE (USAREUR) | 3QFY87/14 | | |
| Q 3RD ID (USAREUR) | 4QFY87/61 | | |
| R 8TH ID (USAREUR) | 4QFY87/61 | | |
| S 2ND ACR (USAREUR) | 4QFY87/14 | | |
| T 11TH ACR (USAREUR) | 4QFY87/14 | | |
| U SETAF (USAREUR) | 4QFY87/6 | | |
| V 2ND AD (FORSCOM) | 1QFY88/43 | | |
| W 2ND ID (EUSA) | 1QFY88/60 | | |
| X 9TH ID (FORSCOM) | 1QFY88/55 | | |
| Y 1ST ID (FORSCOM) | 2QFY88/60 | | |
| Z 1ST CAV (FORSCOM) | 2QFY88/55 | | |
| AA 4TH ID (FORSCOM) | 2QFY88/59 | 4QFY86 | |
| BB 5TH ID (FORSCOM) | 3QFY88/60 | | |
| CC 194TH (FORSCOM) | 3QFY88/18 | | |
| DD 197TH (FORSCOM) | 3QFY88/18 | 1QFY87 | |
| EE 3RD ACR (FORSCOM) | 3QFY88/16 | | |
| FF 29TH ID (NGB) | 3QFY88/21 | 2QFY87 | |

[Note: The above schedule could slip if open issues are not resolved successfully. The issues are: Completion of FIST DMD First Article Test (FAT) and DCT delivery schedules negotiations between Army, USMC and Litton Industries. BCS fielding has been completed except in those units with a fielding date.]

Question. Does the near term solution, the FIST DMD, meet the High Intensity Conflict requirement?

General Thomas. No, the only system available or under development which meets the high intensity conflict requirement is AFATDS. AFATDS is programmed as the single fire support Command and Control system for both the Heavy and Light Forces.

Question. The FIST DMD can send and receive its own FIST-DMD message formats. How many variable format TACFIRE message are in the TACFIRE System? How many of these variable format TACFIRE message formats can the FIST DMD transmit and receive? Is this sufficient for full interoperability with TACFIRE equipped units? Can the FIST-DMD use the KG-3 Cosmic Devices used by the TACFIRE units? Provide details.

General Thomas. There are approximately 140 variable formats in the battalion TACFIRE system. The FIST-DMD can transmit and receive 21 fixed format message which correspond to 17 TACFIRE formats. The current FIST-DMD message set is sufficient for full interoperability with TACFIRE equipped units. In accordance with DOD directives to secure all communications in the tactical arena, NSA develops and controls the use of data encryption and communication link encryption devices. At the time TACFIRE was fielded the only device considered feasible for use was the KG-31, a data encryption device that must be mounted in an equipment rack and uses vehicular power. The VFMED and BCS both the KG-31 to encrypt the data prior to transmission. The FIST-DMD and DMD are portable devices that automate the NSA approved manual authenication procedures currently used over encrypted or unencrypted voice nets.

Question. What is the capability of the FIST DMD in providing essential artillery functions such as Fire Unit Status, Ammunition Accountability, Fire Planning Computations, Tactical Fire Control and Fire Support Control measures?

General Thomas. The FIST DMD will provide the electronic interface with Battery Computer System (BCS), the Mortar Ballistic Computer (MBC), the Q36 Firefinder radar and TACFIRE equipped units. Fielding the FIST DMD and the Digital Communications Terminal (DCT) to the Light Divisions will improve the responsiveness of the fire support elements by allowing fire requests, intelligence/targeting information, fire support coordination/limiting measures and target lists to be digitally transmitted throughout the fire support chain. These devices provide for the composition, review and automatic retransmission to predetermined fire support units/command and control nodes using plain text and formatted messages. The BCS provides fire unit status and ammunition accountability.

Question. Is the TCP the intermediate solution for the Light Divisions? When will it be fielded? What capabilities will it have. What will it cost? Does it mean the High Intensity Conflict requirement?

General **Thomas**. The TCP intermediate solution for the Light Division has been eliminated as an option and will be reflected in the revised plan scheduled for submission 1 August 1986.

**Question**. What capabilities required at the Division Artillery will be available for the Light Division? How does Army level plan to provide the Division Artillery level functions?

General **Thomas**. The capabilities required by both the Light and Heavy Division Artillery Headquarters will be met by fielding AFATDS. In the interim, using the FIST-DMD, the Light Division Artillery Headquarters will be able to communicate digitally with the division/brigade FSE's, artillery battalion tactical operations centers, FIREFINDER radars and the 155 Howitzer batteries. The data/information that can be received/transmitted is limited to that included in the FIST-DMD message formats which include Fire Mission Requests, Subsequent Adjustments, End of Mission/Surveillance, Observer Location, Intelligence Reports, Front Line Trace Updates, Shell Reports, Fire Plan Targets, and Freetext Messages. A great deal of the information needed at or sent to the Division Artillery Headquarters can be transmitted/received using these formats.

**Question**. Will the first AFATDS equipments be fielded to the Light or Heavy Divisions? How does this affect the time that Light Divisions will have to operate with the interim solution?

General **Thomas**. AFATDS will be fielded to the deployed Heavy Divisions initially. The current fielding plan distributes AFATDS as follows: 2nd Armored Division (CONUS) for system shakeout; USAREUR by DAMPL; 2nd ID (Korea) and then CONUS units by DAMPL. Reserve component roundout units will receive AFATDS with their associated active component units. Given current plans, the Light Division will retain the interim solution until FY 93-94 timeframe.

**Question**. What options does Army consider as available, near term candidates for the urgent Light Division requirement?

General **Thomas**. The 6 September 1985 Modified AFATDS Plan near-term capability using the FIST-DMD, the BCS and the DCT is the preferred option. Other available options include the Lightweight TACFIRE system being evaluated by 9th ID and the Brief Case Terminals (BCT) of the Lightweight TACFIRE system as stand-alone devices. Estimated fielding time is 4QFY89 start for LTACFIRE related options.

**Question**. What steps are being taken to provide for an overall Transition Plan for the fielded systems? Of the heavy divisions, how will interoperability between the fielded systems and other emerging $C^3$ systems and communications media be achieved now that the CCS Program has been terminated? Explain in detail how full interoperability will be achieved.

General **Thomas**. An overall transition plan is being developed and will be provided as directed by the Senate and House Appropriations Committees by 1 August 1986. Full interoperability between TACFIRE and emerging systems will be achieved through planned software releases and the use of message/protocol standards such as JINTACSS and STANAG 5620.

**Question**. Why has the Army not conducted the required ASARC/DSARC reviews on the AFATDS program? Explain and justify in detail.

General **Thomas**. Acceleration and modification of an acquisition strategy to include waiver of milestones is permitted by DOD Directive 5000.1 and AR 70-1 The ASARC was given a Functional Area Information Briefing in December 1983 which covered the acquisition strategy and AFATDS objectives. A program directive is currently being finalized, this program directive will be reviewed by the ASARC in FY86. The AFATDS program is currently scheduled to complete the Concept Evaluation Phase (CEP) in March 1987. A combined Milestone I and II ASARC has been scheduled for July 1987, followed by a DSARC.

**Question**. After the AFATDS Concept Evaluation Phase (CEP) software effort experienced serious cost overruns early in the program, the Army and then the Congress capped the program at $49.5M which included a $10.1M contractor investment. How much of the $39.4M government funding CAP has been spent to date? How much of the $10.1M contractor investment has been invested to date? When does Army project the funding ceiling will be reached?

General **Thomas**. The current AFATDS software contract is capped at $36.1 million cost to the government. As of 31 March 1986, 100 percent or $36,080,260 has been obligated and $26,962,587 has been disbursed. The contractor has not invested any money to date, their investment will begin after the government funds are expended. The contractor has agreed to complete the contract regardless of cost.

**Question**. The AFATDS Concept Evaluation Phase (CEP) which was scheduled for completion in March 1987 is now at least two months behind schedule. Assuming it does not slip any further, how long after May 1987 will Army complete the test report? How long will it take for the ASARC/DSARC to certify readiness to begin full-scale development (FSD)? Since no more funds are to be appropriated until FSD commences, how can Army justify its FY 87 request for $40.4M in RDT&E funds when approval for FSD is extremely unlikely before FY 88?

General **Thomas**. The Concept Evaluation Phase is not two months behind schedule. At the present time, all milestones have been met. An analysis of the contractor's status report shows that the CEP will be completed 41 days late. It may be possible to make up this delay. The contractor and the Government are both planning for the Concept Evaluation Phase to be completed on time, i.e., the end of February 1987. A test report will be available within 60 days, or the end of April 1987. After the Concept Evaluation Phase, a software transportability demonstration will be conducted. The Army plans to exercise an option on the existing contract with Magnavox for continued development of AFATDS software for the DT/OT in FY 89. Hardware will be selected for AFATDS and procured under the Army Command and Control System (ACCS) program. The ASARC/DSARC scheduled for July 1987 will address the decision of whether AFATDS should be ported to the ACCS hardware for DT/OT. This decision will be based on the CEP results, software transportability demonstration, support proposals received and hardware demonstrations. The FY 87 funding will support a demonstration of the software portability, software maturation, in-house and matrix support, support contracts and initial funding for DT/OT hardware. The majority of the DT/OT hardware funding will occur in FY 88.

### FIRE SUPPORT TEAM DIGITAL MESSAGE DEVICE

Question. What is the approved Army Acquisition Objective (AAO) for the FIST DMD? Justify these numbers in detail against the existing Army force structure for the record.

General Thomas. The approved Army Acquisition Objective (AAO) for FIST DMD is 1212. This supports the distribution of one FIST DMD per FIST headquarters and one per maneuver battalion in the TACFIRE equipped heavy division. In the Light Divisions the FIST DMD will be issued one for each Division Artillery operations center, two for each Division Fire Support Element (FSE), one per direct support Field Artillery battalion operations center, one per maneuver battalion FSE and one per Brigade FSE. Each unit will also be issued maintenance floats at a rate of 16 percent of the fielded quantities. A total of 62 FIST DMD's are programmed for the nine Remotely Piloted Vehicle (RPV) batteries. One FIST DMD will be issued to each of the two Central Launch and Recovery System (CLRS) and three Forward Control Stations (FCS) per battery. The remaining will be maintenance floats. RPV fielding will begin in FY 88 and continue through FY 92. War reserves account for 94. Quantities planned for fielding to each unit are as previously stated.

Question. The Congress has approved the funding of 555 FIST DMD's through FY 86. Provide for the record how these 555 FIST-DMD's will be fielded—in which divisions, the quantity per division, at what functional nodes, and on what time lines.

General Thomas. The FIST DMD's procured through FY 86 will be fielded through the 8th ID. The units to be fielded, the quantities per division, the functional nodes to use the FIST DMD and the planned fielding dates are as previously stated.

Question. Provide for the record, the approved Basis of Issue Plan (BOIP) for the FIST DMD.

General Thomas. The BOIP is currently being revised to reflect the distribution provided in answer to the question regarding the Army Acquisition Objective. An actual copy of the BOIP itself will be provided under separate cover when approved.

Question. Production funds were provided for FIST DMDs in FY85 and FY86 based upon a May 1984 FDT&E test. Since that time, the processors, display, memory and software have been completely changed or replaced. What development test/operational testing (DT/OT) has been conducted or is planned on this entirely new configuration? Since the current FIST DMD has been modified so dramatically, how can Army be certain this new configuration is ready for fielding until it has been fully and successfully tested?

General Thomas. The new configuration FIST DMD will undergo a complete First Article Test (FAT) including extensive tests of both hardware and software. The FAT includes contractor conducted tests and government conducted tests at White Sands Missile

Range (SWMR). A Follow-on-Evaluation (FOE) will be conducted by the 24th ID in 4QFY86. The FOE is equivalent to an operational test (OT). Based on the above, the production FIST DMD will have been fully and successfully tested prior to fielding.

**Question.** In the event of a FIST DMD software program dump or failure in the field during tactical operations, how quickly can the program be reloaded? What are the procedures? Is this acceptable for a critical $C^3$ item of equipment?

General **Thomas**. The FIST DMD uses Eraseable Programmable Read Only Memory (ERPOM) for storing the FIST DMD software program. The EPROM media cannot dump. The EPROM must be erased by ultraviolet light to destroy the software program. The FIST DMD software, when burned into the EPROM Memory, essentially becomes a piece of hardware. The EPROM can be erased in approximately ½ hour and reprogrammed in a ½ hour, on a one-by-one basis. This capability is for program revision only. The FIST DMD software is loaded in a nonvolatile memory, not requiring reloading which is considered operationally acceptable.

**Question.** Has the FIST DMD successfully completed First Article Testing (FAT)? If not, explain why and provide a detailed schedule for this testing to include the estimated completion dates.

General **Thomas**. No. The First Article Test (FAT) began on 15 April 1986 and is scheduled to be completed on 15 August 1986. The FAT has been delayed because of late delivery of products and components failing to meet test specifications. Fixes have been identified. However, the original fielding schedule is still considered to be valid.

**Question.** Is the FIST DMD Program on schedule? When was fielding planned to commence? What is the current schedule? Provide a timetable for when each TACFIRE-equipped Division will receive FIST DMDs.

General **Thomas**. No. The FAT is resently four to six weeks behind schedule. We are still on schedule to start fielding as planned, provided there is no further slip in FAT.

TACFIRE Units to be fielded FIST DMD are as follows:

| | | | |
|---|---|---|---|
| USAFAS | 3QFY 86 | 4QFY 86 | 2QFY 87 |
| 24th ID | 4QFY 86 | | |
| 1st ID (FWD) | 1QFY-87 | | |
| 7th ATC | 2QFY-87 | | |
| 101 (AMBL | 1QFY-87 | | |
| 2nd AD (FWD) | 2QFY-87 | | |
| 3rd AD | 3QFY-87 | | |
| 8th ID | 4QFY-87 | | |
| 3rd ID | 4QFY-87 | | |
| 11th ACR | 4QFY-87 | | |
| 2nd AD | 1QFY-88 | | |
| 9th ID | 1QFY-88 | | |
| 2nd ID | 1QFY-88 | | |
| 4th ID | 2QFY-88 | | |
| 5th ID | 3QFY-88 | | |
| 197th | 3QFY-88 | | |
| 1st ID | 2QFY-88 | | |

**Question.** What are Army plans for the additional 381 units requested for FY87? Provide, for the record, in which divisions, the

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quantity per division, at what functional nodes and on what schedule these additional FIST DMDs will be fielded? Answer the same question for the planned FY88 purchases.

General **Thomas**. The FY87 procurement will complete the buy for FIST DMD. They will be used to complete the fielding previously provided and provide the war reserve assets. There is not a FIST DMD procurement planned for FY88. The units to be fielded, quantity per division, functional nodes to use the FIST-DMD and the planned fielding dates are as previously stated.

**Question**. Army has now determined that the FIST DMD is unsuitable for its primary mission as a FIST device for the 7 Light Divisions, which will be equipped with a lighter, smaller device. How will this reduce the total quantity of required FIST DMS's?

General **Thomas**. The FIST DMD's AAO has been reduced from approximately 2600 to 1212 during the past year. The decision to field the DCT to light forces company fire support sections reduced the requirement by approximately 300. The remaining reduction was the result of the decision not to field the FIST-DMD to non TACFIRE units and not to fill POMCUS stocks.

**Question**. Army plans for the ACCS Program state that all new systems will use ACCS common hardware and software. The FIST DMD is not an element of ACCS hardware and is not programmed in the DOD standard Ada language. Why should more FIST DMD's be purchased when Army is mandating ACCS hardware and software for other $C^3$ systems?

General **Thomas**. The procurement of FIST DMD's will be completed in FY87. The Army has already procured approximately 75 percent of the AAO for the FIST DMD. To wait until FY89 for ACCS hardware and software to fill the remaining 25 percent is not cost or operationally effective.

## MANEUVER CONTROL SYSTEM (MCS)

**Question**. The conferees had serious doubts about approving production funds for the Maneuver Control System (MCS) in FY86 due to lack of testing and questions about the readiness of the system for fielding. However, because of strong requests from Army, we decided to approve the FY86 production funds. What is the current status of the program? What testing has occurred and what are the results? How many units have been fielded? Provide details for the record.

General **Thomas**. First Article Testing of the TCT has been completed and the first article test report is in final evaluation. Version 9 software Ada is undergoing acceptance testing which will be completed in June. Fielding of the TCT is scheduled for 4th quarter FY86. The fourth and final year of TCT production will be awarded by June. The NDI TCP has passed the technical feasibility test and type classification action is at HQDA for final approval. An initial production contract for the NDI equipment will be awarded shortly. The following testing has occurred:

a. DT II of TCT—Satisfactory results were input to ASARC III production decision.

b. FAT of TCT (included bubble for TCT)—Pass condition—reports being reviewed.

c. TFT of TCP (NDI)—Satisfactory results were input to IPR II production decision.

d. User evaluation of TCT (Ed models) in USAREUR—Input to ASARC III.

e. SRVT of pre-production software versions—Pass prior to each fielding (Version 7 in Europe).

QUESTION. What is the status of the MCS software? Is the Army Ada Language System (ALS) being used on this program? If so, discuss performance. If not, explain why.

General THOMAS. Version 7 software is running on the engineering models of the TCT in Europe. Version 9 software is the first version to be written in the Ada programming language. Version 9 software is currently undergoing acceptance testing and will be completed in June. This version will be fielded with the TCT production hardware. The Ada Language System (ALS), the Army development Ada support and development environment and its associated software tools, was not utilized on the MCS program as it was not available in 1983 when the decision was made to go to Ada. The ALS has not developed a compiler targeted to the MCS target processor.

QUESTION. What are the Army plans for/status of the three principal hardware elements the Tactical Computer Terminal (TCT), Tactical Computer System (TCS), and Tactical Computer Processor (TCP)? How is each performing and what are future procurement and fielding plans?

General THOMAS. The Army terminated the TCS hardware portion of the full-mil hardware contract on March 7, 1986. The TCT has completed first article testing and the test report is in final evaluation. A total of 97 TCTs are on contract with the final 106 to be bought out with FY 1986 funds. The TCT will start fielding in 4th quarter FY 1986 and will complete fielding in FY 1988. The TCTs used in place of the TCSs will have a bubble memory added for additional storage capacity. The NDI TCP passed the technical feasibility test in August 1985. A type classification DA IPR was held and the minutes are at HQDA for final approval. Initial procurement is planned with FY 1986 funds with the bulk of the procurement being bought with FY 1987 and FY 1988 funds. A total of 567 TCPs are planned for procurement with fielding starting in FY 1987 and being completed in FY 1989. The Army's March 5, 1986 MCS plan submitted to Congress lays out the quantities and schedules in further detail.

QUESTION. What are Army plans for transitioning the MCS hardware and software into the ACCS architecture? Explain in detail the schedule of events and detail any additional costs for the record.

General THOMAS. The detailed plans for the ACCS program including the transition of the MCS program into ACCS hardware are being worked and will be presented to the Army leadership in Summer 1986. Once those plans are reviewed and approved the specific schedules will be finalized and funding adjustments made for submission with the FY 1988 President's budget.

## POSITIONING AZIMUTH DETERMINING SYSTEM (PADS)

**Question.** The conferees of the FY86 Defense Appropriations Act were concerned that the Army has no definite plan for the use of the various position/azimuth determining systems both currently in the inventory and in development. Accordingly, the Committee reduced funding for one system, the Positioning Azimuth Determining System (PADS) program to a minimum production level and directed the Army to provide a complete report on position/navigation systems. The budget continues to request funding for these programs, but the Army as yet has not delivered the report due on March 1, 1986. Why should the Committee recommend funding for these programs if the Army is incapable of providing a definite plan for using this equipment?

General **Thomas**. The Army has requested FY87 procurement funding for only those position/navigation (POS/NAV) systems that have clearly defined requirements and users. These systems, Position Azimuth Determining System (PADS), Army Data Distribution System (ADDS), and Global Positioning System (GPS) are critical to the Army modernization efforts. Funding for all of the POS/NAV architecture will be requested once the requirements are finalized. The Army has reduced the number of different systems from 27 to 7 objective systems.

**Question.** What is the problem with producing this report—the Army annually produces a position/navigation document of this nature for its own use?

General **Thomas**. The POS/NAV Master Plan is being coordinated at this time. It is taking longer than we expected to define missions, users, and requirements of the POS/NAV systems. Army apologizes for not sending an interim report to inform you of progress to date.

**Question.** When will the Army deliver this report to Congress?

General **Thomas**. July 31, 1986.

**Question.** For the record did the Army exercise the FY 86 option on the NAVSTAR GPS system?

General **Thomas**. A decision on exercising the FY 86 option on the NAVSTAR GPS system will be rendered after the schedule 15 May Defense Systems Acquisition Review Council (DSARC) meeting. This is a tri-service program with the Air Force as the lead service and executor of the contract. Therefore, exercising of any options must be a joint decision.

**Question.** What is the current status of the R&D and FY 1987 procurement of the NAVSTAR GPS system?

General **Thomas**. The FY 87 R&D and procurement status for the NAVSTAR GPS system is shown below:

*Fiscal year*

[Dollars in millions]

| | |
|---|---|
| Procurement | $15.7 |
| OPA-2 | (5.2) |
| APA | (10.5) |
| RDTE | 4.8 |
| Total | 36.2 |

QUESTION. What has been the results of the testing program to date?

General THOMAS. Both GPS set configurations (1- and 2-channels) have demonstrated an accuracy and operational effectiveness that have met or exceeded established requirements. The problem to date has been the low reliability performance of 1-channel set. The 2-channel set has performed better but is still short of the stated reliability requirement. The Air Force as the lead service and contract executor is negotiating contract assurances that will reduce risk to the Government should the program proceed to a Low Rate Initial Production (LRIP). This decision is scheduled for 15 May 1986. Testing results for the NAVSTAR GPS Army User Equipment to date are:

| Receiver type | Test | Date | Results (MTBF[1] hours) |
|---|---|---|---|
| 1-channel | Developmental | September 1984 | 21.8 |
| 2-channel | Developmental | September 1984 | 12 |
| 1-channel | Developmental | August 1985 | 21 |
| 2-channel | Developmental | November 1985 | 192 |
| 2-channel | Operational | January 1985 | 196 |

[1] Mean Time Between Failure (MTBF). (The MTBF requirement for both type receivers is 500 hours.)

## TACTICAL ARMY COMBAT SERVICE SUPPORT COMPUTER SYSTEM (TACCS)

QUESTION. The Committee understands that the contractor for the TACCS program was so confident of his program that he guaranteed the performance of the hardware in field environment, but that the Army has nevertheless decided to enter into only limited production. The requirement for computers of this type is very strong. The contractor offered the government a no cost guarantee to move into full production. Please explain to the Committee the circumstances that persuaded the Army to limit production for the first year.

General THOMAS. Based on the Army Audit Agency draft report which identified some of the potential problems with the TACCS program, the OSD Computer Resource Council (CRC) scheduled a review on 29 January 1986 of the TACCS program to determine the Army's readiness to proceed into full production.

The CRC concluded that the Army was not yet ready to proceed into full production of TACCS at this time and directed the Army to enter into a limited production the first year despite the contractor's warranty offer. OSD limited the production rate to 60 TACCS/month not to exceed 600 TACCS based on completion of all tasks and a review of the TACCS program NLT August 1986. A full production decision will be reconsidered at the next OSD review.

## SINGLE CHANNEL GROUND AND AIRBORNE RADIO SYSTEM (SINCGARS)

QUESTION. In FY 1986, Congress reduced the budget request for SINCGARS by $120M because the Army advised that it was not proceeding with the next procurement option. The Committee understands the contractor is now about one year behind schedule and that reliability problems persist. The Army reliability criterion is 1250 hours mean-time-between-failure (MTBF). The Committee understands the contractor has requested that the MTBF be lowered.

Does the Army have any intention of lowering its mean time between failure (MTBF) standards in this program? If so, what is the rationale, and how will the effectiveness of the radio in the battlefield environment be affected?

General Thomas. There are no intentions of lowering the MTBF at this time.

Question. What was the cause of the reliability problem?

General Thomas. The reliability problems result from a combination of effects including the design, producibility, workmanship, process and vendor quality.

Question. What is the Army doing to solve the problem?

General Thomas. The Army has approved a contractor funded Test-Analyze-Fix program. Additionally, the Army is working with the contractor to develop a long range reliability and producibility enhancement program for the system.

Question. What other procurement problems has the Army experienced with the SINCGARS program?

General Thomas. The SINCGARS Airborne Radio Production Program is currently projecting a 5 month slippage in schedule. The cause of the slippage results from a need to correct deficiencies found in development testing of the Ground Radio and a two month extended First Article Test Program.

Question. Where does the program go from here?

General Thomas. The program is currently in a test-analysis fix mode. This mode is expected to continue until the reliability performance of the system significantly improves. In the meantime the Army is continuing to negotiate with the contractor to rebaseline the contractual schedule.

Question. The Committee understands the Army is studying other alternatives such as terminating this contract and procuring Non-Development Items (NDI).

How seriously is the Army pursuing this course?

General Thomas. There is no intent at this time to terminate the SINCGARS contract with ITT. However, an NDI alternative is currently being pursued to provide an interim solution to the Army's near term Combat Net Radio shortage. A Commerce Business Daily (CBD) release has asked prospective suppliers to provide literature, technical information and loaned hardware. This approach allows us to first assess the market by performing limited testing on the most promising products. Following the testing of these products, a decision will be made as whether or not to solicit the NDI market with intent to buy.

Question. What sources are available for an NDI approach?

General Thomas. The most promising sources for frequency hopping radios include Rockwell-Collins, Harris, Marconi, Racal and TADIRAN. Non-hopping radios are also being investigated with many candidates expected. Potential sources will be indentified following responses to the Commerce Business Daily announcement.

Question. How much has been committed to this program in R&D and in Procurement, and how much could be recovered if the program were terminated?

General THOMAS. The total RDT&E from Fiscal year 1976–Fiscal year 1986 is $128.5 million which includes costs from a competitive development by three contractors. ITT share of this $128.5M is $40 million and if the program were terminated approximately $2.0M could be recovered. Total procurement for the ground radio is $193.2M committed/obligated from Fiscal year 1983-Fiscal year 1985. $181.1M is planned but not committed. Progress payments authorized to date are $52.7M out of the $193.2M obligated. If the Government terminates for default it is estimated that all of the unliquidated obligations ($193.2—$52.7 = $140.5) plus 50–80 percent of the amount liquidated can be recovered.

QUESTION. Under the circumstances, how would the Army justify continuing the budget plan to contract in January 1987 for $204M to buy 16,000 radios?

General THOMAS. Currently the Army leadership is to meet in late May to address this and other key SINCGARS issues. Therefore, it would be premature at this time to address this question.

QUESTION. The Committee understands that the contractor has been requested to begin limited production in the later part of 1987.

What was the dollar amount and number of radios associated with this request?

General THOMAS. The contractor, on his own, has proposed to proceed with production at a rate that is dependent on the MTBF achieved. Specifically ITT has proposed to limit production to 100 systems per month if the mean time between failure is less then 400 hours, up to 500 per month if greater than 400 hours but less than the required 1250. ITT would not exceed 500 per month until the 1250 hours mean time between failure is achieved. This has not been accepted by the government. Negotiations are continuing.

QUESTION. What is the Army's response to this request?

General THOMAS. At this time, the Army will not accept radios until a 1250 hours mean time between failure is achieved.

QUESTION. Exactly how does the Army's current plan for this program compare to the procurement request in the FY 1987 budget for $204M to procure 16,000 radios?

General THOMAS. Currently the Army leadership is to meet in late May to address this and other key SINCGARS issues. Therefore, it would be premature at this time to address this question.

QUESTION. Over the longer haul, and for the record, what is the revised schedule for the SINCGARS program as a result of these problems?

General THOMAS. The Army is currently negotiating with the contractor to rebaseline the contract schedule and therefore a revised scheduled is not yet available.

### UNIT LEVEL CIRCUIT SWITCH (ULCS)

QUESTION. Earlier this year, General Wickham said to the Committee: "The Army has no plans now to use MSE at echelons above corps. However, as we refine the communications architecture and requirements for echelons above corps, we will not exclude any aspects of the MSE system as potential candidate solutions." What is the potential for using commercial switching equipment rather than using militarized switching equipment in Echelons Above Corps?

General Thomas. Use of indigenous communications assets to include host-nation switching is planned. Additionally, alternatives are being examined which would provide military (TRITAC and MSE) switching in the backbone network with digital, secure connectivity to perform the war-fighting and sustaining functions of EAC forces. Commercial switching systems are being planned for use in wartime, procured from available sources on an as-needed basis, to support the internal communications needs of various headquarters and command posts, and to provide additional access to host-nation commercial telephone systems. The commercial switching and host-nation capabilities will supplement and not replace the military switches in the EAC digital network.

Question. What plans does the Army have for its switching requirements at Echelons Above Corps? If undecided, when will the Army decide.

General Thomas. The Army is conducting a review of the communications and switching needs of EAC. The Army review is an evaluation of EAC tactical communications and the current course of action (TRITAC architecture) and alternatives integrating MSE type functions into the currently planned system. Each alternative is being evaluated in a comparative analysis based on communications requirements, operational capabilities, joint and allied interoperability, personnel/force structure and cost. The review is scheduled for presentation to the Army leadership in late May, to be followed by coordination and discussion in the Joint and OSD arenas. Alternatives are being examined which maximize the utility of the TRITAC assets already procured and which incorporated several levels of MSE capabilities such as mobile subscriber service, flood search routing, automatic user affiliation, and the use of MSE nodal signal centers.

Question. The FY 1987 budget projects a FY 1988 procurement of 10 large unit level circuit switches for $25 million.

Does this request mean that the Army has decided to participate in the ULCS procurement program? If not, what is the Army's posture with regard to the ULCS programs?

General Thomas. The Army has not yet decided which particular switch will be used to meet the Unit Level Switch requirement. However, we expect that the review mentioned earlier will be completed in June 1986 and the appropriate switches can be procured from this generic program line.

Question. Would the ULCS program support the Army's emerging Command and Control System (ACCS) architecture.

General Thomas. Yes, a secure, digital transmission and switching system with the capacity and speed of MSE or TRITAC will support the Army's Command and Control System (ACCS) architecture.

Question. Why are there two programs, the Mobile Subscriber Equipment (MSE) program, and the Unit Level Circuit Switch Program (ULCS) for switches having similar sizes and capabilities?

General Thomas. The Mobile Subscriber Equipment program is an entire communications system comprised of transmission, terminal, and switching equipments for corps and divisions, while the

ULCS program is a family of switches for use at Echelons Above Corps (EAC). The MSE program is a total package solution to Corps and Division area communications shortfalls with mobility, speed of installation, reliability and flexibility. ULCS is a switching component of the TRITAC communications system for EAC. The Marine Corps has been designated as lead service for the ULCS project within the TRI-TAC program and as such is pursuing the procurement of AN/TTC-42 (150 line switches) and SB-3865 (30 line switches). The Army was originally participating in this program with the Marine Corps. However, with the approval of the MSE program, the Army is conducting a study to determine if it would be more cost effective and operationally advantageous to procure MSE like switches to satisfy its ULCS requirement instead of procuring the AN/TTC-42/SB-3865 switches. This study is nearing a decision on the best switch to satisfy EAC requirements. Both programs are required to provide a cohesive and viable theaterwide swtiched architecture.

**Question.** Are there features and capabilities of the ULCS switches that equip them to satisfy unique requirements that MSE equipment could not satisfy?

General **Thomas**. Baseline EAC requirements could be met by either switch. There are technical differences in the mode of operation of the ULCS and MSE switches. These differences are significant enough that the switches are not architecturally interchangeable. The basic question is whether a pure TRITAC or an enhanced TRITAC architecture is the best solution for EAC. The Army review will clarify the comparison of these alternative capabilities.

### MANEUVER CONTROL SYSTEM (MCS)

**Question.** The FY 1986 Appropriations Committee conference report provided specific guidance for redirection of the Maneuver Control System (MSC). The Appropriations conferees last year expressed concern over the high cost of military standard equipment in this program and directed the Army to limit military standard equipment to the forward deployed and early deploying active forces for European, Korean and Southwestern Asian Theaters. That adds up to about eleven divisions. Why is the Army planning to field military standard equipment to 17 of the 18 active Army Divisions?

General **Thomas**. The distribution was made based on the criteria of providing limited MIL STD terminals (9/Div) with NDI equipment for all other workstations, to the forward deployed and early deploying forces of the active component for the European, Korean, and Southwest Asian theaters. These units all deploy within the first 30 days of conflict.

**Question.** Based on the March 1986 Army plan, the 6th Infantry Division alone will receive ruggedized commercial equipment. Was this division singled out so that the Army could say it complied with the conferees second directive to supply "other active forces" with nondevelopment equipment? What military rationale can you provide for equipping 17 of the 18 active divisions with military standard equipment and 1 division with ruggedized commercial equipment?

General **Thomas**. No. The rationale for equipping the 17 active divisions with military standard equipment was based on the criteria that these divisions but not the 6th Infantry Division were all either forward deployed or deployed within the first 30 days of conflict in support of the European, Korean, and Southwest Asian Theaters.

**Question**. Completion of fielding of this expensive military standard generation of equipment is scheduled for FY 1989. Cheaper replacement equipment is scheduled for fielding in FY 1990. The Committee's rationale for funding 11 divisions was that the Army planned to turn that equipment over to the 10 Guard and Reserve units beginning in 1990. The Army plans to equip 17 active divisions, instead of 11. What does the Army plan to do with the 6 additional division sets it will begin replacing in FY 1990?

General **Thomas**. The MIL STD equipment will not start to transition to the RCs until FY 90 and out. Naturally, there will be some attrition in the 4-7 years that this hardware will be in the Active Component. Once the transition is complete, the remaining equipment can be used for POMCUS, war reserves, and can be issued to RAOC organizations, and other units which are routinely attached to Corps during tactical operations. They will also be used as spares and repair parts.

**Question**. Part of the conferees's rationale for directing a limited number of divisions to be equipped with military standard equipment was to take advantage of sunk costs in the program. Why then did the Army decide to disregard entirely one of the key militarized components, the Tactical Computer System (TCS) after it has already committed to buy 26 of them at $1.5 million a copy for a total of $39 million.

General **Thomas**. The revised MCS O&O plan provides staff processing capability through the use of TCPs and ACs. The use of a group of TCPs provided the opportunity to eliminate the high cost TCS from the MCS architecture. In addition, there was a problem with the TCS software development and the communications interface module being developed by General Dynamics. Delays in obtaining a working compiler left us with a high risk approach which resulted in a 12-18 months delay before we could field and an undetermined additional cost growth.

**Question**. What was the total amount the Army had committed for TCS hardware and software development, and how much of that will the Army be able to recover?

General **Thomas**. The Army can recover approximately $19M of the $39M sunk hardware costs of the TCS. As an example, the bubble memories will be used on the TCTs. Additionally, printers, power converter modules, and other accessories and common parts are reuseable in support of the TCTs. In addition, the Army will avoid future life cycle support costs for TCS hardware and software, on the order of $3.5 [illegible] per year in FY 86 constant dollars.

**Question**. Did the Army consider keeping the TCS and fielding a more limited number of all ruggedized divisions—while equipping the balance of the force with much less expensive NDI equipment as the conferees directed?

General **Thomas**. Yes, the Army reviewed the entire MCS program in light of the Congressional guidance and the new O&O

plan. The increased flexibility of communications provided by the TCPs allowed us the opportunity to eliminate the high cost TCS while at the same time increasing the staffing processing capability at Corps and Division. Only 9 full-mil TCTs will be fielded per division to provide the survivable "thin rod of steel" at the critical nodes. All other devices within the division, are NDI. (21 TCP/24 AC.) The 17 active divisions are either forward deployed or deploy within the first 30 days of conflict.

Question. What problems does this approach present in view of the fact that the Army had significant sunk costs in the military standard equipment, and that replacement equipment is scheduled to start fielding in 1990?

General Thomas. We don't view this so much as a problem, but as an opportunity to build on lessons learned. The increased use of TCPs and ACs in the architecture will provide the staff processing capability found so important in the 9th ID testbed. The use of a group of TCPs allowed us to eliminate the high cost TCS. The TCPs will be provided to the other four nodes of the SIGMA Star (ACCS) to provide an interim ACCS capability and to provide valuable information for the development of the follow-on systems. The full-mil TCT will be transitioned to the Reserve Component upon the fielding of ACCS hardware, and we will recover a significant portion of the TCS sunk costs.

Question. Is the Army continuing to develop interim MCS capabilities in Korea and at Fort Hood, Texas? If so, why? How does this activity relate to procurement plans for the MCS system now and its replacement in 1990?

General Thomas. The Korea effort "CP TANGO" is a fixed station, Echelons Above Corps (EAC) system and indirectly relates from an interoperability standpoint to MCS. Some valuable lessons are being learned on such things as local area networks. The III Corps effort is directly related to the MCS effort. The equipment is the common MCS NDI hardware and it will utilize the common MCS software baseline. This effort will facilitate the establishment of the Total Systems Tactical Validation (TSTV) test site and provide valuable feedback to the MCS and ACCS programs.

Question. The conferees directed the Army to complete the buy of the MCS nondevelopmental equipment in FY 1987 so that fielding and an aggressive test and evaluation program could occur prior to the fielding of the replacement equipment in 1990. The Army program spreads the buyout through FY 1988 and keeps its original schedule of fielding this equipment right up to about the point in time when replacement equipment will begin fielding. Why is that?

General Thomas. The Army, as a result of insufficient funds in FY 1987, is planning on buying out the MCS NDI equipment in FY 1988. The final fielding will be completed in 1989. This schedule will enable an extensive field test and evaluation program to be conducted on the system and the results applied to the subsequent ACCS program.

Question. The conferees directed the Army to establish an aggressive test and evaluation program for MCS. The Army has testified before the Committee that the aggressive testing program it does have for the Mobile Subscriber Equipment (MSE) program,

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will have at least the following features. The Committee is interested in how this testing program compares to the MCS testing program. Will the MCS program feature component and system testing throughout the manufacturing process? If not, why not?

General THOMAS. Yes, insofar as First Article Testing (FAT) and Periodic Production Testing (PPT) of both full-mil (TCT) and NDI (TCP) are included in the production contracts in accordance with standard Army procurement practice. In addition, MCS System operational testing is being conducted this year and is planned to continue into FY87. Additionally, software testing is an integral feature of any new software release (annually).

QUESTION. Will the MCS program feature testing at virtually every fielding at every unit? If not, why not?

General THOMAS. Not as described for MSE. All MCS production equipment will be tested according to standard Army practice during production. System tests will be accomplished during FY 86 and early FY87. As MCS is fielded in each unit, training will be conducted in a hands on mode which serves as a "system check out" of the equipment. This will ensure that MCS system within each unit is working in a satisfactory manner.

QUESTION. Will the MCS program feature a formalized feedback system from users in the field? If not, why not?

General THOMAS. Yes, in a number of ways:

a. Both hardware and software faults and recommendations are reported in Deficiency Reports (DRs) (2407).

b. A MCS European Working Group (EWG) meets semi-annually in Europe with PM representatives to consider all user problems and suggestions and to make recommendations.

c. Two ACCS testbeds (MCS is part of ACCS) are being established, one at 91D (Division level), and the other at III Corps (Corps level), which will validate user requirements and provide feedback to PM, OPTADS as well as PM, ACCS.

d. An MCS Field Office has been established in Europe to coordinate user matters.

e. All software changes enamating for the above sources, or from TRADOC, etc., are considered by a MCS configuration control process.

NOTE: The DRs, EWG, MCS Field Office and Configuration Control process are already in place. The ACCS Test Beds are currently being established.

QUESTION. Will the MCS program feature periodic evaluation of system performances on major military exercises by the project manager and the Signal Center? If not, why not?

General THOMAS. Yes. At present the following periodic field evaluations are planned:

a. Operational Assessment (OA) of the MCS NDI (TCP) with 41D (Fort Carson, CO), in June 1986.

b. Follow-on Evaluation (FOE) 1 in VII Corps (Europe) in FY 1987.

c. FOE 2 in VII Corps (Europe) in FY 1988.

Additionally, T&E with 91D, and possibly III Corps is being considered for the FY 1987 timeframe, to address MCS/DCCS convergence efforts. It should be noted that the OA and FOEs are spon-

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sored by OTEA in conjunction with the PM and the proponent, CACDA.

QUESTION. Will the MCS feature field test of interoperability with current and emerging automation and communications systems? If not, why not?

General THOMAS. Yes. The interfaces with current Army communications systems are being tested at the JTC3A Joint Test Facility (JTF) at Fort Huachuca, AZ. These interfaces will also be tested during the scheduled operational assessments and follow-on evaluations. National Interoperability with other Battlefield Automation Systems have already been tested in principle where they currently exist. As ACCS systems emerge, interoperability will be tested. International Interoperability testing is being planned within a currently active quadrilateral (US, GE, UK, FR) forum.

QUESTION. Will the MCS feature field tests in a degraded network and hostile electromagnetic environments identified in the threat? If not, why not?

General THOMAS. Yes, these areas are planned to be addressed during FOE 1 and FOE 2. Nevertheless, it should be remembered that both are really features of the various communications systems upon which MCS relies, and not MCS itself, which is not a communications system.

QUESTION. For the record, provide a detailed description of the test and evaluation program the Army has established for the MCS program.

General THOMAS.

a. Environmental

(1) TCT: DT II—Completed 1982; FAT Scheduled for completion—May 1986; PPT—1987 and as necessary.

(2) TCP (NDI): TFT—Completed 1985; FAT—Scheduled for August-October 1987; PPT—1988 onwards, as necessary.

b. Software (MCS V9)

(1) TCT: PPT—April 86; SRVT—May 1986; CST—June 1986.

(2) TCP: IST—May 1986; SRVT—June 1986; CST—June 1986.

(3) MCS V10 Etc. As above during 1987.

c. Systems and Operational: User evaluation in Europe (ED Models) completed 1982; OA of TCP—June 1986 in CONUS; FOE 1—FY 1987 Europe; FOE 2—FY 1988 Europe; Convergence testing of MCS/DCCS at 9ID—FY87.

NOTE: SRVT—System Readiness Verification Test; CST—Communication Sub test; PPT—Program Performance Test; FAT—First Article Test; TFT—Technical Feasibility Test; IST—Integrated Systems Test.

QUESTION. The Army has been developing an automated tactical command and control program for about twenty-five years. The conferees directed an aggressive test and evaluation program "to insure maximum transfer of MCS experience to the follow-on ACCS program. How does the Army plan to exploit the experience it will have from using this generation of fielded MCS equipment—so that the ACCS replace program will benefit from this experience prior to its production and fielding?

General THOMAS. The Army will gain considerable experience from the fielded MCS system and the testbeds in which it operates. Feedback from formal exercises and operational evaluations, along with continuous input from formal feedback systems on both hardware and software will be collected and evaluated. This information will be provided to the PM ACCS for use in refinement of ACCS protocols, interface standards, specifications, architecture, and hardware and software requirements. This will also be used to improve operator and maintenance training and to verify maintenance and logistics concepts.

QUESTION. Does the Army plan to demonstrate a prototype MCS hardware and software system in an operational environment prior to making further MCS production commitments? What is the rationale for the Army position?

General THOMAS. Engineering models of the TCT have been in operation in Europe since 1981 and we already have three years of production hardware on contract. In order to comply with Congressional direction to buy out the full-mil equipment in FY 1986 and to avoid a production break, we plan to award the contract for the remaining TCTs as soon as possible. A small initial procurement buy of NDI equipment will be awarded soon to get the production line moving. This is considered a low risk, low dollar investment to achieve the earliest fielding schedule as possible. Prior to the large scale purchase of NDI equipment with FY 1987 funds, an operational assessment will be conducted with TCTs, NDI equipment, and Version 9 Ada software.

QUESTION. Based on the quantities presented in the Army MCS procurement plan in March 1986 and unit cost figures submitted in the February 1985 budget justification, the total MCS funding request would be about $141 million. Please explain why the total for these units in the March 1986 plan comes to $223.6 million, an increase of $82.6 million.

General THOMAS. The cost estimates submitted with the March 5, 1986 plan were based on engineering estimates of the MCS equipment in its present configuration. The NDI equipment has changed substantially in configuration and capability from the equipment envisioned back in February 1985. In addition, the system architecture of the MCS has been modified, incorporating additional NDI equipment to provide staff processing capability and allowing the deletion of the TCS. At Corps and Divisions, TCPs will be serving all points of the SIGMA Star, providing valuable lessons learned for the follow-on ACCS program. Based on differences in quantity, type, capability, and mix of equipment, a comparison with unit prices of February 1985 is invalid. A proposal is now in hand from the NDI contractor and the MCS baseline cost estimate is being updated. Once these are evaluated, the cost estimate for the MCS program may very well be reduced resulting in more NDI equipment being able to be procured in FY 1987 and a reduction of funding requirements in FY 1988.

## ARMY DATA DISTRIBUTION SYSTEM (ADDS)

QUESTION. The ADDS program is intended to provide the Army with a reliable, jam resistant, high speed computer-to-computer data communications system. It is a combination of Position Location Reporting System (PLRS) equipment and Joint Tactical Information Distribution System (JTIDS) terminals. The Committee understands that the Army has experienced reliability problems with Position Location Reporting System (PLRS) units and some compatibility problems when using new computer equipment with older computer equipment. Please describe these problems in more detail for the Committee.

General THOMAS. In order to meet the user's stated requirements in the field, the PLRS user unit must be able to demonstrate a 1000 hours mean time between failure in the contractor's facility. The units, until recently, have been unable to achieve this level of performance. The PLRS reliability problems have been determined to be attributable to quality control deficiencies. With regard to the computer issue, Congressional language restricted the making or buying of any performance improvements to the AN/UYK-20 computers. The AN/UYK-20A, an expanded memory version of the AN/UYK-20, is used in the PLRS Master Station. Based on agreements with the Marine Corps concerning use of the Navy standard computers for the PLRS, the AN/UYK-44 was selected as the replacement processor. The AN/UYK-20A software is not directly transferable to the AN/UYK-44.

QUESTION. Do you regard them as significant hurdles for the program to overcome?

General THOMAS. Both problems have had an impact upon the program's schedule. However, considering the progress in both areas, neither is considered a significant hurdle at this time.

QUESTION. What is the Army doing to correct these problems?

General THOMAS. The PLRS Production Program consists of two phases called Production Verfication and Full-Scale Production. The contractor cannot proceed into the second phase until he successfully completes the first phase, which includes a Reliability Growth Program. Reliability Growth is structured as a test, find, analyze and fix cycle. To date, the program has achieved considerable success in ferreting out latent defects. As an illustration, the user unit started with a test value of 200 hours mean time between failure (MRBF) in the surface vehicle test chamber. Projected MTBF is now in excess of the 1000 hours contractually required. First Article Test for the user units includes a Reliability Demonstration, during which the units must demonstrate a 1000 hour MTBF. The Defense Contracts Administration Service and the Army have taken steps to ensure that the contractor is taking immediate and positive action to correct any remaining quality related deficiencies. With regard to the computer issue, the Army is converting software which will allow the AN/UYK-44 to emulate the AN/UYK-20A. This approach was selected in order to minimize impact upon program cost and schedule. The conversion is continuing and is costing the Army approximately $9 million and a slip in schedule of 4 to 8 months.

QUESTION. The Committee understands that the Army's Basis of Issue Plan for the ADDS has been revised as the result of changes in the force structure. To what extent will the revision have an impact on the requirement, cost and schedule for the ADDs program? Give us a general picture and provide details for the record.

General THOMAS. The Army has been reevaluating their total data distribution needs with respect to traffic volume and speed of service requirements. Analyses to this point indicate that equip-

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ment increases in one area will be offset by other reductions. For example, the Army is considering reducing the number of JTIDS terminals while increasing the number of Enhanced PLRS user units. No final decision has been made to change the ADDS Basis of Issue Plan.

**Question.** Is the ADDS program experiencing enough delays that it would be prudent to delay the program until Army Command and Control Systems (ACCS) hardware and software are available?

General **Thomas.** No, it would not. The ADDS is a data distribution system designed to permit communications between battlefield automation systems. As such, it is required as soon as possible as the communications link between and among current automation systems and the ACCS when fielded. ADDS is unique equipment and not part of the ACCS common hardware or software.

**Question.** What would be the schedule impact on the ACCS program if production of PLRS were stopped until reliability goals were met?

General **Thomas.** The production of PLRS components is critical to the ADDS program. The ADDS will initially draw heavily upon both user unit and master station hardware and software. Without any equipment to modify, the ADDS program would be delayed by approximately 6 to 9 months. The only ACCS system upon which this would have a direct schedule impact is the Forward Area Air Defense Command and Control (FAAD $C^2$) system, due to its dependency upon the ADDS. A 6 month delay in initial and subsequent fielding of FAAD $C^2$ would be caused.

**Question.** How does that schedule compare with the availability of ACCS hardware and software?

General **Thomas.** Even delaying PLRS, the ADDS will still be fielded in FY 1989. The first availability of ACCS common hardware and software in the field scheduled for 4th QTR FY89. Since the ADDS will enhance the operational performance of current battlefield automation and sensor systems such as TACFIRE, MCS, etc., until the ACCS is fielded, delaying the ADDS until ACCS is available is not operationally sound.

**Question.** Would program savings be achieved if this course were followed and ACCS hardware and software were procured for ADDS?

General **Thomas.** As I stated earlier in this testimony, the ADDS is the communications link between and among battlefield systems. It is unique equipment and not part of the ACCS common hardware or software procurement.

### ARMY COMMAND AND CONTROL SYSTEM (ACCS)

**Question.** The Army Command and Control (ACCS) laydown program has been in the formulation stage since April 1985. It is intended to identify and acquire a family of militarized, ruggedized and commercial ADP equipment and software systems to implement the Army's command and control subordinate systems and tactical architecture. What are the objectives of the ACCS Laydown program?

General **Thomas.** The objective of the Army Command and Control System (ACCS) program is to provide a systematic approach to satisfying the requirement for interoperability and compatibility of computer hardware and software on the battlefield. This approach to the development and fielding of the ACCS will include:

a. Common buy of hardware and software with improved ILS.

b. Maximum use of Non-Developmental Items (NDI) and state-of-the-art technology.

c. Interoperability implementation.

d. Synchronized fielding of unit sets.

e. Centralized management.

All these actions will provide a significant reduction in initial investment of software and hardware as well as a reduction in total life cycle costs.

**Question.** General Thomas, has the Army established requirements for the ACCS program? If so, what are they?

General **Thomas.** Yes. The Army requirements for the ACCS have been derived from the existing ROCs and O&O Plans for the nodal control systems of the Army Command and Control System. These requirements continue to be scrubbed by the TRADOC schools/centers to further adjust quantities and levels of hardness (survivability). The recommendations are being used to formulate an acquisition and fielding strategy which will be completed and presented to the Army leadership during Summer 1986. At that time, adjusted hardward requirements by year in terms of quantity, equipment type, and funding will be incorporated into FY88 President's Budget.

**Question.** What benefits do you see for the Army in the ACCS Laydown program?

General **Thomas.** The ACCS Program strategy is to procure a compatible suite of common hardward (transportable computers, portable computer, peripheral devices and hand held terminal). This can be accomplished under one common hardware procurement. Secondly, the most promising way for the Army to reduce and manage its spiralling software costs is to rapidly acquire common system and support software and produce functionally unique applications software packages using Ada, but designed at the onset with software reuse in mind. Thirdly, one Integrated Logistics Support (ILS) package or strategy will suffice. By taking maximum advantage of available (off-the-shelf) and evolving commercial computer technology, including software, the Government will more readily and cost effectively field and sustain state-of-the-art command and control systems. The program is structured to minimize Research and Development (R&D) investment and maximize the use of NDI off-the-shelf hardare and software for the most cost-effective solution.

**Question.** What is the general time frame for the implementation of this program?

General **Thomas.** ACCS is being developed on a software-first basis. Current schedules will permit fielding of ACCS common hardware in the 1989 timeframe.

**Question.** Just over a year ago, the Army abandoned its program to develop and acquire a family of battlefield ADP equipment, the Military Computer Family (MCF) program. How does the ACCS laydown program differ from the MCF program?

General Thomas. The ACCS is significantly different from the Military Computer Family (MCF) in both acquisition strategy and scope. The MCF was a developmental effort specifying identical hardware from the microchip and card level up. The Army was paying for equipment development, and all equipment was developed to military specifications. The ACCS, on the other hand, is software based. Hardware supporting that software covers a range of hardness, from full military specification to commercial off-the-shelf equipment. All hardware will be provided competitively based on a non-development item (NDI) commercial off-the-shelf acquisition strategy, rather than attempting to design and develop unique hardware.

Question. About what levels of funding do you anticipate over the next five years for the ACCS laydown program:

a. for research, development, test and evaluation?
b. for equipment acquisition?
c. for operations and maintenance?

General Thomas. Those specific figures have not been finalized. They are being developed as a part of the final proposed acquisition and fielding strategy for ACCS programs which will be presented for approval to the Army leadership during 4th quarter FY 1986. Required funding levels will be included in that presentation. At that time, adjusted hardware requirements by year in terms of quantity, equipment type, and funding will be incorporated into the FY 1988 President's Budget.

Question. The ACCS Laydown program appears to be an ambitious initiative. What are the risk factors that could lead to program delays and cost increases?

General Thomas. The ACCS program is subject to the same risks as other programs. However, certain characteristics of the ACCS program mitigate against those risks. Centralized management (PM ACCS) will ensure that the various ACCS subordinate programs remain synchronized to assure fielding in unit sets. The Ada Software is being developed first, and the government is utilizing an NDI off-the shelf acquisition strategy. Common hardware and software are being used to the maximum extent possible allowing more flexibilty in the fielding of the ACCS systems. Unstable funding of the ACCS subordinate programs could lead to program delays and resultant cost increases.

Question. The Army has consolidated the ACCS programs under one program office. Do you think one Program Manager can effectively manage the many ACCS subordinate programs?

General Thomas. The PM ACCS will not directly manage the many ACCS subordinate programs. Each of those programs has its own manager who will remain responsible for the execution of his program. It is envisioned that PM ACCS will coordinate, integrate, lead, and directly control (technical, programatic, schedule and financial) the subordinate project managers. He will place primary management emphasis on reducing proliferation of unique hardware and software systems, applying the higher order language (Ada), program intergration, interoperability and oversight.

## SINGLE CHANNEL OBJECTIVE TACTICAL TERMINAL (SCOTT)

**QUESTION.** The Army is requesting $70.7 million for development of SCOTT. The SCOTT program is aimed at developing a ground terminal for use with the MILSTAR satellite communications system. The terminal is designed to provide survivable communications for all services in a high jamming and nuclear scintillated environment.

Although production of SCOTT was initially scheduled to begin in FY 1986, changes to the acquisition plan have put the program back into the research and development phase. A contract for full-scale development of 15 terminals was awarded in December 1985 to Magnavox Corporation. Total cost of this firm fixed price contract is $106 million. The terminals are expected to be ready for operational testing in September 1988.

The Congressional Descriptive Summary for FY 1987 shows a total development cost for SCOTT of $442.9 million. Why is the cost so high, given the $106 million firm fixed price contract? What other work does the program entail?

General **THOMAS.** The Congressional Descriptive Summary for FY 1987 is incorrect; an errata sheet showing the correct information has been published. The FY 1987 budget request was based upon a $235.0 million SCOTT program. The current estimated cost of the SCOTT engineering development program is $223.0 million. The major elements of this cost estimate are:

| *Major cost elements* | *Millions* |
|---|---|
| Basic engineering development contract | $106.0 |
| Options on basic engineering development contract | 17.7 |
| Training simulator development | 37.5 |
| System project management | 44.2 |
| Engineering support-Lincoln Lab/ERADCOM | 10.7 |
| COMSEC and ancillary equipment | 1.3 |
| Software modifications | 5.6 |
| Total | 223.0 |

**QUESTION.** Provide for the record a funding profile, by fiscal year, for SCOTT development.

General **THOMAS.** The current estimated SCOTT engineering development program funding requirements are ($M):

| Fiscal year: | *Amount* |
|---|---|
| 1985 | 3.7 |
| 1986 | 38.8 |
| 1987 | 70.7 |
| 1988 | 65.8 |
| 1989 | 33.1 |
| 1990 | 10.9 |
| Total | 223.0 |

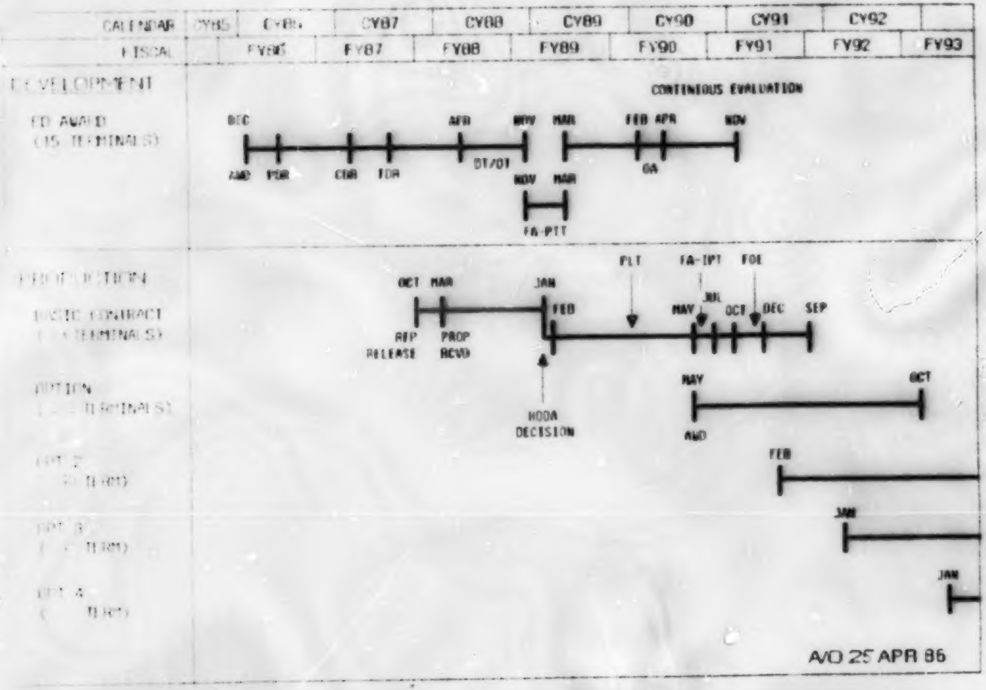
**QUESTION.** What effect has the change in acquisition plans had on the projected deployment timetable for SCOTT?

General **THOMAS.** Initial deployment of SCOTT terminals has slipped one year. FY 1984 low rate initial production program would have delivered terminals beginning in FY 1988. In FY 1985, the program was restructured to complete engineering development. The restructured program will provide 15 engineering development models for Development Testing and Operational Testing in FY 1988 and the deployment and continuing evaluation of refurbished terminals in FY 1989. Deliveries of initial production units will commence in FY 1991. An operational assessment will be conducted in FY 1990 prior to continuing production.

QUESTION. How much time will be allocated for operational testing of SCOTT development models? Will the production decision be made after all testing is completed? Provide for the record a complete milestone chart.

General THOMAS. Development Testing II and Operational Testing II (DT/OT II) is a combined, continuous testing program. DT/OT II is schuduled for April—October 1988. As shown in the milestone chart below, the initial production decision will occur in January 1989. The restructured program will provide 15 engineering development models for Development Testing and Operational Testing in FY 1988 and the deployment and continuing evaluation of refurbished terminals in FY 1989. An operational assessment will be conducted in FY 1990 prior to continuing production.

# SCOTT MILESTONE CHART



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**Question.** What are the projected quantities of SCOTT for each service? Provide for the record a procurement profile, showing quantities and funding by fiscal year.

General **Thomas.** The current projected quantities and estimated required procurement funds for the services' SCOTT requirements are: ———.

**Question.** How does SCOTT satisfy the services mobility and transportability requirements?

General **Thomas.** The SCOTT will be mounted in an S-250 shelter which is mounted on a M1028 CUCV. Thus, the SCOTT is relatively small, light and rugged equipment. It will meet all transportation specifications regarding movement by air, highway, or water craft.

**Question.** Will the MILSTAR satellite be available when SCOTT is deployed?

General **Thomas.** Present Air Force launch schedules call for the first launch of the MILSTAR satellites to begin ———. Army deployment is thus planned to coincide to the maximum extent possible with the availability of satellites.

**Question.** What effect will delays in the Space Shuttle program have on deployment of MILSTAR and SCOTT?

General **Thomas.** The Air Force has advised that the delay in the availability of the shuttle is not expected to significantly delay the launch of MILSTAR satellites, which do not begin until ———. It is felt that the relatively high priority of MILSTAR assigned by the President, and alternative expendable launch vehicles now being considered as an alternative to the shuttle mitigate against potential delays.

### ANTI-ELECTRONIC JAMMING MODEMS

**Question.** The USC-28 anti-electronic jamming modem is used by strategic users of DOD's Defense Satellite Communications System (DSCS) to satisfy their secure communications needs. The Committee understands that about $300M has been contracted for procurement of over 100 USC-28s before a satisfactory test performance in an operational environment.

We understand that the 1984 tests by the Army were declared unsatisfactory due to the lack of a validated jamming threat by military intelligence officials. What is the jamming threat to these modems? Is the jamming threat now validated by intelligence officials? If not, how can operational tests and procurement of the USC-28 proceed?

General **Thomas.** A validated jamming threat exists. It has been documented by the Defense Intelligence Agency in DST-2610E-12-85 titled Joint MILSATCOM Threat Summary, dated June 1985. This supersedes the Joint MILSATCOM Threat Summary DST-2610E-12-83, dated January 1983.

The AN/USC-28 ECCM Network Supplemental System Test performed from April 3, 1984 to May 2, 1984 was successfully completed. The tests established a high level of confidence that the AN/USC-28 could pass user traffic with acceptable performance over an extended period of time.

**Question.** We also understand that Air Force operational tests of the USC-28 in 1984 were declared unsatisfactory—and that follow-on operational tests by the Army after 1984 were also unsatisfactory. Please tell us whether that is the case, and if so, how a $300M contract for procurement of the USC-28 could have proceeded under these circumstances?

General **Thomas.** The tests in question refer to the operational tests of the AN/GSC-49 satellite terminal. The AN/USC-28 modem is a component of this terminal.

The Air Force test in question was the operational test of the An/GSC-49, Jam Resistant Secure Communications Satellite Terminal from 5 September 1984 through 4 December 1984. This test represented the evaluation of the initial deployment of the AN/GSC-49 in support of an operational user-to-user system: the Tactical Warning and Attack Assessment (TW/AA) Network. This test identified the need for additional Electronic Counter Countermeasures (ECCM) network and system-level control and operational procedures. No significant material deficiences were found during these tests regarding the AN/USC-28 modem. The test also identified reliability, availability and maintainability (RAM), human factors engineering (HFE) and safety deficiencies with components other than the AN/USC-28 in the AN/GSC-49 terminal. Actions are being taken by the material developer to correct these problems and support the future fielding of these terminals.

The follow-on operational tests by the Army in question were the 1985 test conducted by the Defense Communications Agency (DCA), in conjunction with the Army and Air Force, of the same 1984 AN/GSC-49 network. The AN/GSC-49 terminals were tested with other components of the TW/AA configuration to isolate individual faults and confirm fixes made to the supporting satellite communications system experienced during the 1984 Air Force test. As a result of these tests, in July 1985, DCA declared this terminal deployment configuration the initial operational capacity for the AN/GSC-49. This configuration is currently supporting the TW/AA network and full end-to-end circuit certifications are in progress.

**Question.** Please tell the Committee the situation today with regard to the status and results of operational tests of the USC-28. Are there still significant anti-jamming problems with the USC-28? If so, what are DOD plans for dealing with them? Under the circumstances, is it prudent to procure more of the USC-28s in FY 1987?

General **Thomas.** Since the mid-1970's, the AN/USC-28 modem has progressed through the traditional development, production and operational test programs. Design, material, software, procedural and training improvements initiated in response to these tests have resulted in full material release for operational use in September 1984.

During the last three years, attention to operator and system-level procedures and training have contributed most to enhancing the operational availability of the AN/USC-28 modem. To improve the overall system-level control and peformance of the Jam Resistant Secure Communications (JRSC) system, a Defense Satellite Communications System (DSCS) Electronic Counter Countermeasures (ECCM) Control Subsystem (DECS) is being procured and will provide an automated interface between terminals equipped with the AN/USC-28 and DSCS control sites.

The AN/USC-28 modems are meeting operational requirements. Some 88 AN/USC-28 modem units containing 465 receiver/transmitter units have been deployed worldwide and are operational in both fixed and mobile facilities. An additional 30 AN/USC-28 modems and 274 receiver/transmitter units are now in production. Based on the terminal performance in the ECCM Network Supplemental System Test of April–May 1984, subsequent deployments and with the DECS system-level improvements, there are no antijam operational problems with continuing deployment and use of the AN/USC-28.

QUESTION. Please provide for the record a detailed description of the nature and results of the contractor laboratory engineering analysis and the operational tests of the USC-28 to date, the significant problems identified at each stage, plans for correcting outstanding problems, and plans for future tests.

General THOMAS. Since 1976, three contractor supported tests have been conducted: First Article—In Plant Test (FA-IPT) of engineering development models, 1976; Developmental Test II (DT II), 1977; and Production FA-IPT, 1981. During the AN/USC-28 production phase, three First Article systems were subjected to comprehensive environmental and electrical tests at the contractor's plant to ensure full compliance with the performance specification. The next 12 systems were given somewhat less detailed and primarily electrical tests at the plant. The remainder of the production run is being given normal quality assurance and abbreviated electrical performance checks under the supervision of DCAS personnel at the plant. The on-going production program includes Level B Acceptance Tests on every system produced. In addition Level C System Software tests are performed every time a software version update is completed.

In addition to these contractor tests, in 1983, a Follow-On Evaluation (FOE) of the AN/USC-28 was conducted to provide data for analysis and evaluation of the operational effectiveness and suitability of the system for integration into the Defense Satellite Communications System (DSCS). Two sites participated in the FOE: Sunnyvale AFS, CA and Ft. Detrick, MD. The results identified a lack of operator network training and no previous over-the-satellite network testing as the major contributors to requiring further testing. A Reliability, Availability and Maintainability (RAM) retest was conducted in late 1983 using a five site network. Software and procedural improvements were determined to be necessary. These improvements were accomplished and proven effective during a April-May 1984 Supplemental System Test utilizing the same five sites. Additional software refinements were made following the supplemental system test and material release was granted September 1984. The planned deployment of the DSCS ECCM Control Subsystem will further enhance overall network and system-level performances and control and further integrate the AN/USC-28 into the DSCS. No operational tests focusing on the AN/USC-28 are scheduled or considered necessary.

QUESTION. The DOD is also acquiring an anti-jam control modem (AJCM) for tactical users of DSCS. What has been the testing experience with this modem?

General THOMAS. The Anti-Jam and Control Modem (AJCM) completed Developmental Test and Operational Test II (DT/OT II) in 1983. Three critical test issues were identified:

1. Adequacy of technical manuals.
2. Network control procedures.
3. Reliability.

The Non-Nodal Terminal (NNT) passed successfully

The Nodal Terminal (NT) did not meet the test due to insufficient testing hours.

The Network Control Terminal (NCT) failed due to heat problems. This test was repeated in May 1985 with satisfactory results.

The AJCM entered production in August 1985. A follow On Evaluation is planned in FY 1987 to confirm correction of the shortcomings and the suitability for operational use.

QUESTION. Do the test results warrant further procurement of this modem?

General THOMAS. Yes. The required performance of the Anti-Jam and Control Modem (AJCM) equipped tactical satellite communications terminals was demonstrated during the 1983 Operational Test II. The AJCM will be integrated into over 400 tactical and strategic terminals and is required to provide a jam-resistant communications capability for the Services' Ground Mobile Forces Satellite Communications System. The adequacy of the technical manuals and operational procedures are being addressed and will be reevaluated prior to FY 1988 operational deployments.

QUESTION. Please place in the record by appropriation account for the AN/USC-28 and the AJCM the dollars and number of units funded and the dollars and number of units contracted through March 1986, and procurement plans for each modem through the remainder of FY 1986, FY 1987, FY 1988, FY 1989, FY 1990, and FY 1991. For each modem also indicate the total inventory objective and the total estimated cost of the program.

General THOMAS. The Army develops and procures the anti-jam modems for use in the Defense Satellite Communications System (DSCS) and the Ground Mobile Forces Satellite Communications Terminals. A summary of executed and planned programs for the AN/USC-28 and Anti-Jam and Control Modem Programs are provided below. The procurement programs include requirements for all the Services and DOD Agencies. The DSCS Five Year Program/Plan is the basis for the Army procurement plan for the AN/USC-28 Modem. Although the current program/plan indicates an additional 10 units require funding in FY 1991 to complete the DSCS inventory objective; the Defense Communications Agency is actively pursuing plans to develop a next generation Universal modem. Initial planning indcates that funding after FY 1987 will be restructured to support the universal modem program.

The AJCM procurement program supports the Service's tactical satellite terminal anti-jam communications upgrade for the AN/TSC-85, NA/TSC-93, AN/TSC-94 and AN/TSC-100; the DSCS-tactical communications gateway facilities; network control facilities; the Air Force NATO Airbase Satellite Communications System and the Army training base. A final procurement is planned in FY 1986 to complete this program. AN/USC-28 Program:

| | RDT&E | | OPA 2—Procurement | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Basic units | | Mitigation | | Totals | |
| | Millions | Quantity | Millions | Quantity | Millions | Quantity | Millions | Quantity |
| March 1986 and prior | $13.3 | 6 | $230.8 | 118 | | | $244.1 | 124 |
| Fiscal year 1986 | | | | | 18.9 | 7 | 18.9 | 7 |
| Fiscal year 1987 | | | 2.7 | 2 | 1.2 | 2 | 3.9 | 4 |
| Fiscal year 1988 | | | 3.8 | 3 | 3.0 | 8 | 6.8 | 11 |
| Fiscal year 1989 | | | 10.7 | 8 | 4.4 | 6 | 15.1 | 14 |
| Fiscal year 1990 | | | 16.5 | 13 | 8.3 | 8 | 24.8 | 21 |
| Fiscal year 1991 | | | | | 16.5 | 10 | 16.5 | 10 |
| Total | 13.3 | 6 | 264.5 | 144 | 52.3 | 41 | 330.1 | 191 |

ANTI-JAM AND CONTROL MODEM (AJCM) PROGRAM

| | RDT&E | | Procurement | | Total | |
|---|---|---|---|---|---|---|
| | | | Basic Units | | | |
| | Millions | Quantity | Millions | Quantity | Millions | Quantity |
| March 1986 and prior | | | $146.1 | 447 | $146.1 | 447 |
| Fiscal year 1986 | | | 66.5 | 232 | 66.5 | 232 |
| Total | | | 212.6 | 679 | 212.6 | 679 |

### FORWARD AREA AIR DEFENSE COMMAND AND CONTROL SYSTEM (FAAD C²)

QUESTION. The Army wants to acquire a Forward Area Air Defense Command and Control (FAAD C²) system to automate command and control operations associated short range air defense (SHORAD) weapons. FAAD C², formerly called SHORAD C², includes the acquisition of software and integration of that software with command, control and communications equipment from other Army programs.

The beginning of FAAD C² full-scale development continues to be delayed because the Army keeps changing its approach for acquiring the system. The Army held a Systems Acquisition Review Council (ASARC) in 1985 during which it approved an approach that would begin fielding FAAD C² systems in 1989. Since the ASARC, the Army has devised an alternative approach that is not as accelerated as the ASARC-approved program and would place FAAD C² systems in the field beginning in 1990. In addition, the Army now plans to consolidate under a single FAAD program the acquisition of FAAD components related to C², ground and airborne sensors, and systems used to identify aircraft in forward areas. A Defense System Acquisition Review Council for the overall FAAD program is scheduled for July 1986.

Although the Army favors the alternative approach because, in part, it is less risky than the ASARC-approved approach, the alternative strategy also entails risk. The Army plans to begin procurement of FAAD C² components before the system tests are scheduled. Specifically, the March 20, 1986, FAAD $C^2$ schedule show that procurement of the ground and airborne sensors and Army Command and Control System (ACCS) hardware are scheduled to begin during the FY87-FY89 timeframe. However, the Army plans to conduct FAAD $C^2$ development and operational tests during FY1990.

The Army's alternative FAAD $C^2$ acquisition approach will result in development starting with one set of hardware and software but ending with a different set. The FAAD $C^2$ contractor will begin development using its proposed set of hardware and by designing and coding software for use with that hardware. Later in the development, the Army plans to substitute hardware and software from the ACCS program, which is an effort to standardize hardware and software among Army battlefield functional areas, including air defense and fire support.

The Committee is concerned that for several years the Army has been unable to develop an acceptable approach for acquiring the FAAD $C^2$ system. Why has the Army and OSD not yet agreed on an acceptable approach for acquiring FAAD C2?

General THOMAS. The Army Systems Acquisition Review Council (ASARC) concluded 4QFY85. The Army delayed the Defense Systems Acquisition Review Council (DSARC) scheduled for 1Q86 to integrate the SHORAD $C^2$ concept with the overall Forward Area Air Defense (FAAD) system concept. This total FAAD system to include weapons, sensors, identification systems, and $C^2$ was briefed to the Secretary of Defense in January 1986 and was approved in concept by OSD. The Army is now preparing for an overall OSD FAAD system review and DSARC this summer that will include the DSARC decision for beginning FAAD $C^2$ full scale development.

QUESTION. The Committee is concerned about the Army's proposed approach to begin procurement of sensors and ACCS hardware for the FAAD $C^2$ program before system development and operational tests are scheduled. The Committee understands that the Army devised the approach to meet an urgent fielding need. However, the program has languished for almost three years at the current stage of development, so urgency now is questionable. Such a highly concurrent acquisition strategy in other programs has resulted in procurement of systems that do not work well when fielded. While the Army has reduced risks somewhat by pursuing off-the shelf items, tests of all hardware and software components together should be done before the Army commits to large purchases of equipment. What risks are associated with procurement of the sensors and ACCS hardware before FAAD $C^2$ development and operational tests are scheduled?

General THOMAS. The FAAD $C^2$ acquisition strategy emphasizes the use of non-developmental hardware. The sensor will be selected following a comprehensive evaluation (shoot-off) of actual industry hardware candidates. Both operational and developmental testers will be represented on the evaluation team. A contract will be awarded for a limited buy following the evaluation. Prior to continued production after the initial buy, first article tests and a initial operational tests will be conducted. The $C^2$ production is actually the integration of common Army hardware such as trucks, generators, radios and ACCS displays and processors. The testing on these will be performed by the appropriate agency prior to procurement. We will begin limited procurement of common hardware and integration of these into FAAD $C^2$ sets to support integrated system testing, production (integration) proveout and initial fielding. The cost risk is relatively low as the hardware could be prioritized to other users of this common hardware if initial testing indicates a need for further work prior to a full scale production decision. The Army Operational Test and Evaluation Agency will be involved in system development and subsystems tests from the beginning to monitor and evaluate progress and provide assessments prior to each decision point such as initial procurement. The FAAD $C^2$ testbed now being fielded at Fort Lewis will provide additional information to support procurement decisions prior to full objective systems DT/OT.

Question. Rather than committing to large purchases of sensors and ACCS hardware before systems tests are completed, could the Army instead buy only the minimum number of sensors and hardware needed to conduct development and operational tests?

General Thomas. Yes, and that is essentially what we are doing. Limited quantities will be procured to support testing, production (integration) proveout and to maintain a more economical procurement. Full scale production of sensors and integration of FAAD $C^2$ unit sets is to follow both ACCS hardware tests and FAAD $C^2$ integrated tests.

Question. The Committee understands that the ACCS program will provide common hardware and software to meet several Army battlefield functional needs and commends the Army in seeking a commonality goal. Inherent in such an approach is the risk that equipment generic to all battlefield functions might not be able to meet some performance requirements for a specific battlefield function. In air defense, for example, some of the more critical performance parameters pertain to data processing speed, computer memory size, and system input and output capacities. How has the Army assured itself that ACCS will provide hardware and software that meet all the critical FAAD $C^2$ performance requirements?

General Thomas. Yes, FAAD $C^2$ and other subordinate systems hardware and software requirements have been provided to PM, ACCS for use in developing his hardware specifications and determining common software tasks. The resulting ACCS hardware specifications have been coordinated with PM, FAAD $C^2$. Common software functions have been identified and the majority of these are expected to be provided through software efforts already underway for the Maneuver Control System (MCS) and Advanced Field Artillery Tactical Data System (AFATDS).

Question. How might FAAD $C^2$ development be affected if deliveries of ACCS hardware and software are delayed?

General Thomas. Delays in delivery of common ACCS hardware will affect initial operational testing and fielding. Software development is expected to begin on surrogate hardware and transition to ACCS hardware as available. Operational testing is planned to be performed on ACCS hardware. We expect that much of the common software will be drawn from software under development now for MCS and AFATDS. The initial FAAD $C^2$ effort concentrates on the ADA applications such as ADA control and targeting. Integration of common software to perform the force integration tasks is planned for the second software build and will be tested prior to full scale production decisions.

[Clerk's note.—End of questions submitted for the record.]

WEDNESDAY, APRIL 16, 1986.

## NAVY COMMUNICATIONS, COMMAND AND CONTROL

### WITNESSES

REAR ADM. WILLIAM J. HOLLAND, JR., USN, DEPUTY DIRECTOR OF SPACE COMMAND AND CONTROL, DEPARTMENT OF THE NAVY

BRIG. GEN. ROBERT J. WINGLASS, USMC, DIRECTOR FOR MATERIEL DIVISION, INSTALLATIONS AND LOGISTICS, UNITED STATES MARINE CORPS

### INTRODUCITON

Mr. CHAPPELL. General, thank you very much.

We come now to the Navy for command, control and communications. This program will be presented by Rear Admiral William J. Holland, Jr., Deputy Director, Space, Command and Control. He will be joined at the table by Brigadier General Robert J. Winglass, United States Marine Corps.

Admiral Holland, your entire statement will be placed in the record. Please proceed.

Admiral HOLLAND. I appreciate the opportunity to appear before the committee today.

I would note before we take the questions that if the Navy command and control program appears complex, it is because it is. Rarely do we have a single program in all the large number of programs that we have presented to you which operates for a single purpose or on a single issue. All interact with forces other than those for which they were primarily intended, and with significant second effects often invisible to the planner or user.

Our investment and modernization programs are complicated by the requirements to remain in operation, the command and control components, and their links at all times since there are naval forces always at sea over the oceans.

It is a pleasure to be here this afternoon, and I will try to answer the qustions that you have, sir.

[The statement follows:]

## Prepared Statement of RADM William J. Holland, Jr.
## Deputy Director, Space, Command, and Control

### I. (U) INTRODUCTION

(U) Mr. Chairman, I am pleased to have this opportunity to discuss the Navy's Command and Control Program. I will provide you with a broad perspective of how our program meets the requirements of the National Strategy in general and its maritime component in particular.

(U) The Maritime Strategy is founded on basic United States national security objectives. This national military strategy has consistently focused on three interrelated elements: deterrence, forward defense, and alliance solidarity. I will describe during this briefing how Navy Command and Control supports all of these elements. While these elements of national strategy have remained constant, the world environment and threats to our interests have not. In the maritime arena, two major factors have evolved. First, Soviet naval and military threats have become truly global. Second, an era of violent peace has emerged and threatens international order and stability.

(U) To deal with these threats effectively and to maximize the utility of our resources, we require the capability, on a global scale, to exchange critical command instructions with our naval forces wherever they may be and whenever the need arises.

(U) The U.S. Navy continues to have as fine a peacetime and crisis management command and control system as exists in the free world. The program we have designed and for which we request your continued support should ensure continuation of our capability to meet the expanding global threats we face in the world today.

(U) The Navy's command and control programs are structured to: (1) build a more survivable and enduring command and control system capable of supporting our forces from peacetime and crisis situations through any level of conflict; (2) enhance the readiness of our strategic and tactical forces with needed command and control upgrades for mobility, interoperability, maintainability, and sustainability; (3) correct existing inadequacies in response to emerging global threats while taking advantage of new technologies; and (4) develop new command and control initiatives to improve our existing capabilities, thus effectively meeting our new mission needs.

(U) In the remainder of my statement I will address the Navy's key strategic command and control issues, tactical command and control systems, special issues of interoperability, space operations, the ashore and afloat components of the Navy Command and Control System, and the research and development programs which support future Navy Command and Control capabilities.

### II. (U) Strategic

(U) The President has given strategic command and control improvements top priority in his Strategic Modernization Program. This priority is reflected in various National Security Decision Directives (NSDD) and OSD policy statements such as the Defense Guidance. The command and control systems that support our strategic forces must be survivable as they provide the link between employment plans and mission capability. Strategic command and control must be capable of operating under the most severe stress and must be survivable and enduring throughout all phases of nuclear war.

(U) The Navy has developed a balanced strategic command and control program to provide survivable and enduring support to its strategic forces. The key elements of this program are the submarine radio broadcast systems, extremely low frequency (ELF) communications system, the TACAMO airborne relay system, an endurable reconstitutable radio network based on ships routinely operating at sea and the interconnections and command elements which control these systems.

The submarine radio broadcast system is a highly redundant and overlapping system of long range very low frequency (VLF) and low frequency (LF) transmitting sites supported by an interconnecting landline and microwave communications network. The ability of this system to respond instantly to message traffic originated by the National Command Authority (NCA) to fleet ballistic missile (FBM) submarines is continuously tested, end to end, and a more than DELETED percent reliability is consistently demonstrated.

The extremely low frequency communications system provides a unique capability to submarines. Its ability to penetrate sea water DELETED enhances sea-based nuclear deterrent forces by protecting their assured survivability, reducing detectability of surface observables (magnetic, wake, and other non-acoustics), and increasing operational flexibility. With ELF, submarines can continuously operate at optimum patrol speeds and depths while maintaining a continuous receive connectivity to the National Command Authority. ELF provides great operating flexibility to our FBM's, thereby adding insurance against a Soviet anti-submarine warfare breakthrough.

Operational evaluation of the ELF system using the upgraded Wisconsin transmitter facility is in progress. We expect completion this month, with Initial Operational Capability (IOC) by June 1986. Full Operational Capability (FOC) for the DELETED Michigan and Wisconsin transmitters and production ELF receivers for all operational submarines is expected in 1988.

(U) The TACAMO program, which provides a continuous airborne relay capability for communications to our strategic fleet ballistic missile submarines, is vital to National and Navy interest. TACAMO is the key survivable communications node in the Minimum Essential Emergency Communications Network (MEECN). The continuous relay capability and the ensured survivability provided by TACAMO aircraft assures that our FBM submarines will receive instructions to execute their mission should that terrible eventuality ever be required. TACAMO provides obvious assurance to the Soviets that retribution for any attack cannot be avoided; it is the substantive key to deterrence.

(U) Although the turboprop EC-130 has performed the TACAMO mission reasonably well in the past, a replacement aircraft is required to meet the increased communications demands of the TRIDENT fleet. The E-6A replacement program has been tailored to reduce acquisition time and cost with minimal risk. The E-6A engineering design is derived from the mature and proven USAF E-3/707 airframe using the commercial CFM-56 engine and incorporating existing mission equipment. The E-6A will provide an aircraft that will meet the communications relay requirements of expanding TRIDENT submarine operating areas. The program is a major command and control element of TRIDENT and other Strategic Forces Modernization Programs and has the highest priority and support from OSD and JCS. Eventually this new airborne relay aircraft will be capable of receiving Emergency Action Messages from MILSTAR which will be the most reliable and enduring injection component of the MEECN. Space for this injection mode does not exist in our present aircraft - a larger plane is a requirement to meet the strategic goals of reliability, survivability and endurance which MILSTAR and TACAMO promise.

The survivable and reconstitutable HF mobile communications network is a recent initiative that in time of national emergency provides redundant communications connectivity from the National Command Authority to our fleet ballistic missile submarines. DELETED

III. (U) Tactical Command and Control Systems

(U) Emphasis on modernization of our tactical command and control systems is a necessary reaction to the growing capabilities of the threats we face in the world today, both Soviet and Non-Soviet. Given the decided numerical advantage in forces enjoyed by the Soviets, the U.S. policy has been to counter threats by technological superiority and qualitative edge. New Soviet ships, aircraft and submarines are the end product of a strong Soviet commitment to qualitative improvement. These systems are technologically sophisticated and highly capable. Soviet client states, even as technologically backward as Libya and North Korea, have also shown steady qualitative equipment improvements and represent an increased threat.

(U) The fleet and commanders at sea require upgraded command and control systems to provide the real time coordination necessary to respond to new threats which have shorter reaction times, lower detection thresholds and greater mobility. Because of the complexity of command and control, and the necessity to avoid piecemeal solutions, we are consolidating resources and the top-level engineering management of core battle force command and control systems into a single integrated Battle Force Information Management (BFIM) program.

(U) The Battle Force Information Management (BFIM) program is planned to include these eleven systems:

Advanced Combat Direction System (ACDS),
Command and Control Processor ($C^2P$),
Joint Tactical Information Distribution System (JTIDS),
Tactical Data Information Link J (TADIL J),
Link 11 Improvements,
High Frequency Anti-Jam (HFAJ),
Afloat Correlation System (ACS),
Extremely High Frequency Satellite Communications (EHF SATCOM),
Electronic Warfare Coordination Module (EWCM),
Tactical Flag Command Center (TFCC), and
E-2C Avionics Update Program.

The Navy system engineer has been tasked to define and establish the system interface requirements and interface design specifications for all the BFIM programs. He may use a variety of techniques and procedures to ensure commonalty such as common software formats, common message formats or a translator unit. Once the requirements are validated, the systems commands (COMSPAWARSYSCOM/COMNAVAIRSYSCOM/COMNAVSEASYSCOM) shall ensure the interface requirements and specifications are adhered to by the program managers responsible for the development of the individual systems. In terms of development and procurement, we hope to benefit from enhanced commonality among individual components, improved synchronization of schedules, and more efficient test and evaluation. The program will also achieve the operational advantages of improved connectivity for the Navy's command and control systems and ensured joint and combined interoperability in hostile situations.

(U) Key examples of our effort under the BFIM program umbrella are:

(1) (U) Advanced Combat Direction System (ACDS) is a needed modernization program for the 1960 vintage hardware in our Navy Tactical Data System (NTDS). These upgrades improve our capability to meet a higher

order of threat which we face today and expect to face in the future. The improvements include new computers (UYK-43), new and improved displays, and new information data link equipment (JTIDS). To achieve maximum effectiveness from this new hardware, new computer software and operator interfaces will be provided. The ACDS will be system engineered to process dissimilar data, expand sensor integration, better manage links, and improve decision aids.

(2) (U) High Frequency Anti-Jam (HFAJ) will develop and procure conventional and anti-jam HF communication systems with voice, data, and teletype capability. This equipment will provide the primary tactical communications capability for command and control of naval forces beyond line-of-sight distances. This longer range capability is vital if we are to exploit our ability to detect earlier and process faster. Its only alternatives - satellite systems and UHF relay devices are not only more expensive but lack durability and flexibility which are inherent in HF systems. Anti-jam HF not only supplements UHF anti-jam media for inter/intra-battle group and amphibious group connectivity but will provide the only theater/area/fleet wide communications network in which all elements are earthborne in survivable platforms.

(3) Link 11 improvement program is designed to provide line-of-sight (LOS)/beyond-line-of-sight (BLOS) tactical data link with (1) improved processing, (2) increased number of net participants DELETED (3) higher data rates and (4) improved platform and net performance monitoring. Improved Link 11 hardware will be installed in ships/submarines and aircraft (E-2C/P-3C/S-3A). Link interoperability among our allies will be maintained during and after this upgrade. Improved Link 11 compliments JTIDS LOS/Extended-Line-of-Sight (ELOS) Link 16 with LOS/BLOS Link 11 on battle force platforms that do not have JTIDS.

(4) (U) Command and Control Processor ($C^2P$) will provide for all communications processing associated with transmission and reception of data link (Link 4/Link 11/Link 16) messages that must be performed external to surface combatant tactical data systems (TDS). The $C^2P$ will be the interface between the communications systems and the processors associated with the particular TDS employed. The $C^2P$ will also perform all functions associated with JTIDS terminal control and initialization and with interfacing the JTIDS terminal with the TDS.

## IV. (U) Interoperability

(U) The Navy recognizes the value of intrinsic Service capabilities, but given the decided numerical advantage held by the Soviets today no Service can operate alone just as the United States cannot go without its allies.

(U) We have several key programs and initiatives underway to fulfill our command and control interoperability requirements. In the area of very high frequency (VHF) and ultra high frequency (UHF) voice anti-jam communications, we will incorporate the Army's Single Channel Ground Air Radio System (SINCGARS) and the Air Force's Have Quick system voice capabilities into our radio systems. Our ARC-182 combination airborne UHF/VHF radio will incorporate both Have Quick and SINCGARS anti-jam capability. Aboard our ships we will modify our existing WSC-3 line-of-sight (LOS) tactical UHF radio with the Have Quick voice anti-jam system and will procure modified Army SINCGARS VHF voice anti-jam radios.

(U) Air Force Joint Tactical Information Distribution System is our program to satisfy anti-air warfare (AAW) tactical data requirements. The Navy has decided to procure Time Division Multiple Access (TDMA) terminals through the JTIDS Joint Program Office. Navy's JTIDS program will modify these terminals for Navy aircraft and ships, testing them to ensure suitability for ships and carrier aircraft, developing necessary interfaces, and integrating them into CV, CG, DDG, E-2C, and F-14D platforms. Other voice and data requirements that cannot be satisfied by USAF JTIDS terminals will be met by increasing the mix of voice and data systems now deployed or in development.

## V. (U) Naval Command and Control System Ashore.

(U) The Naval Command and Control System (NCCS) Ashore is a worldwide system of operational command centers as well as intelligence and surveillance processing centers which provide tactical information to all levels of Navy command. The intelligence and surveillance centers are the primary sources of both raw and evaluated maritime tactical data for the Unified CINCS, JCS and the national level intelligence organizations. A total of 37 nodes comprise our NCCS Ashore Program. These nodes perform the important function of processing and correlating thousands of pieces of all source data and disseminating a huge variety of tailored products to force, fleet, theater, national and NATO users. Upgrades to the current relatively austere system to improve overall capacity and throughput and to ensure interoperability among the nodes are planned. The Ocean Surveillance Information System (OSIS) Baseline Upgrade (OBU) will take advantage of information acquisition, processing and display developments to modernize the Navy Command Center, the three Fleet Command Centers and the five associated intelligence support nodes. Through this mechanism we shall establish a single system architecture for NCCS Ashore and will provide core software and hardware for the upgrade of the remaining submarine and surveillance operations support sites.

## VI. (U) Naval Command and Control System (NCCS) Afloat.

(U) The afloat command and control is an aggregate of components which take sensor inputs both from within and outside the battle group, correlate and fuse this all-source information for display and support decision making by afloat commanders. This processed and correlated sensor data displays the total tactical picture and assists the commanders in formulation and dissemination of force orders and direction.

(U) The Tactical Flag Command Center (TFCC), which will be installed on all carrier and command class ships, is the core of the NCCS Afloat. The TFCC provides the Officer in Tactical Command (OTC)/Composite Warfare Commander (CWC) with automated decision aids to assist in the management of the steadily growing amount of sensor data to afloat commanders. Several key subsystems now under development will interface with TFCC. The Afloat Correlation System (ACS) is designed to accommodate non-organic sensor inputs from shore processing sites and together with the inputs from the Advanced Combat Direction System (ACDS), for organic sensor data, combine to provide an all source tactical situation. Presently we are fielding a Prototype Ocean Surveillance Terminal (POST), which correlates and displays information in order to provide our at sea commanders with an interim capability in this regard.

— DELETED imagery also is now provided afloat via the Fleet Imagery Support Terminal (FIST) using UHF or SHF satellite links. This imagery plays a critical role in target location and planning. An Electronic Warfare Control Module (EWCM) is being developed to optimize the management and employment of our own electronic warfare systems afloat while correlating all enemy electronic emissions.

NCCS Afloat is connected within the battle group by the OTC Information Exchange System (OTCIXS) and will interface with the NCCS Ashore via the Tactical Data Information Exchange System (TADIXS). These systems can be used independent of radio frequency but are fundamentally satellite systems in the UHF and SHF regions. SHF satellite communications provides DELETED connectivity from our shore command centers to our numbered fleet commanders flagships and the USS LASALLE in the Indian Ocean. Expansion of this SHF capability to battle group flagships is currently under review.

## VII. (U) SPACE

(U) There is a growing interest by the other armed forces in the importance and utility of space-based systems but, the Navy remains the largest tactical user of space based systems. The Navy's interest, role, and dependence upon space and space-based systems continues to grow. Geography and mobility drive us to be the primary users of satellite communications, navigation, meteorology and oceanography systems.

The reliability of communications between afloat commanders and their assigned units and the shore based commanders resulting from our comprehensive Ultra High Frequency Satellite Communications (UHF SATCOM) System has been rewarding. This system now carries the bulk of Navy's tactical and intelligence communications. DELETED

To meet the minimum essential wartime requirements in a highly stressed environment, the Navy is pressing forward in developing Extremely High Frequency (EHF) SATCOM terminals to employ the Military Strategic, Tactical and Relay (MILSTAR) Communications Satellite being developed by the Air Force. The requirement for MILSTAR is straightforward. It will provide an anti-jam, low probability of intercept, secure, survivable wartime command and control communications system. This system will not reach initial operational capability until [illegible] and even when fully operational it will not have the capacity to handle all the communications requirements which the Navy - not to mention its other customers - know we need. FLTSAT, LEASAT and the UHF follow-on satellites will continue however, to provide the bulk of critical tactical communications in peacetime, crisis, and contingencies well into the 21st century.

(U) The Navy continues to support the NAVSTAR Global Positioning System (NAVSTAR/GPS) as the primary means of obtaining both precise traditional navigation data and time. NAVSTAR/GPS, by providing an accurate geographic reference, will assist greatly in the track correlation of targets by removing the navigational error which complicates such correlation and force employment today. With all platforms sharing the same reference point(s), our ability to identify and classify hostile platforms and raids will increase dramatically as well as our ability to optimize offensive and defensive actions while minimizing ordnance expenditures. This same global positioning accuracy will also enhance our over-the-horizon weapon systems delivery capability.

The availability of accurate and timely meteorologic and oceanographic data is essential for effective conduct of all naval missions. Space-based systems offer the most reliable means of gathering this information and providing the data to dispersed users on a real time basis. In addition to planning for the continued use of civil weather satellites, the Navy will take full advantage of the Defense Meteorological Satellite Programs (DMSP) and is presently developing the Navy Remote Ocean Sensing System (NROSS). No funded system, other than NROSS, satisfies Navy's unique need for DELETED secure oceanographic data to support the efficient employment, routing, and target planning requirements of our operational forces and weapons on a global scale. The Navy will continue to work with the Air Force in addressing common system requirements for an eventual "upgraded" DMSP, however, we know now the "upgraded" DMSP will not be available until the end of this century. NROSS offers capability substantially earlier.

## VIII. (U) Research, Development, Test and Evaluation (RDT&E).

(U) To meet the expanding threat and to maintain technological superiority and qualitative edge in command and control systems, the Navy maintains an active, but balanced, research and development program. We actively seek new technologies and evaluate emerging technology to try to exploit any military command and control application in a realistic and cost-effective manner.

(U) The Navy's present major emphasis is directed toward strategic communications, surveillance and anti-jam technology. Our major RDT&E efforts for 1987 are (1) the TACAMO E-6A aircraft, (2) Extremely High Frequency (EHF) satellite terminals, (3) Navy Remote Ocean Surveillance System (NROSS), (4) Relocatable Over the Horizon Radar (R-OTHR) (5) Tactical Data Information Link, Joint (TADIL J), and (6) NAVSTAR global positioning system.

(U) We have increased our development, test and evaluation commitment significantly to (1) shore-ship communications, (2) security systems, (3) communications automation, (4) afloat correlation, (5) WWMCCS Information System modernization, and (6) expanded capability for our Anti-submarine Warfare Operations Centers (ASWOCS).

## IX. (U) Conclusion

(U) In concluding my remarks, I would like to stress that achievement of a comprehensive and integrated command and control system is necessary to implement our national policy of deterrence and the maritime strategy. Modern, maintainable, and sustainable command and control systems that are capable of surviving and enduring in all levels of conflict are essential to properly use our expensive and capable weapon systems.

(U) As demonstrated by recent world events, one of our greatest strengths is our mobility. This advantage of naval forces is perhaps even more important today than at any other time in our history. The ability to conduct sustained global, forward deployed operations, whenever and however they are needed, and without the consent or cooperation of any foreign government, provides the United States a responsiveness to changing international conditions unmatched by any other country. This flexibility, however, which is a major part of our strength, places significant demands on our command and control systems. Unable and unwilling to rely entirely on major fixed sites and nodes, we are designing and fielding systems that respond quickly to changes in our missions.

(U) The command and control programs we have developed and seek your continued support for present a balanced and affordable approach in support of national policy and the maritime strategy.

(U) Mr. Chairman, this concludes my prepared statement and I would be happy to answer any questions you or the Committee might have. Thank you.

Mr. **Chappell**. Thank you, Admiral.
Mr. Murtha.

### SINGLE CHANNEL GROUND AIRBORNE RADIO SYSTEM (SINCGARS)

Mr. **Murtha**. Admiral, let me ask you about the Single Channel Ground Airborne Radio System. The Army has been experiencing significant problems with the SINCGARS program and has been engaged in difficult negotiations with contractors involving the possibility of terminating the contract.

The Army is the lead procurement agency of this program. Why did the Navy negotiate its own contract with the contractor for the purchase of the SINCGARS radios?

Admiral **Holland**. We just heard General Thomas tell us the trouble that the Army is in with SINCGARS. We negotiated with the Army about half of the 92 radios that we are buying for Seals, which is a very small order. We were told by the Army that they had no further room within that contract which existed and either they or we were going to have to write another contract, and therefore it was a question of having to put in another contract either by the Navy or by the Army.

So the Navy contracting officers let that contract under the same basic terms as the Army's. The Navy's contract, for example, requires that all of the radios that we buy meet the Army's requirements in reliability in the field and that they meet all of the Army's requirements in maintainability and in operational capability.

Mr. **Murtha**. What are the rules for approval of one Department to negotiate a separate contract for procuring an item for which another Department has been named the lead purchasing agent?

Admiral **Holland**. There are a number of instructions and I don't have them here but I can submit those for the record.

[The information follows:]

References are Department of Defense Instruction 4115.1 of 1 September 1972 (DOD Coordinated Procurement Program—Purchase Assignments) and the DOD Supplement to the Federal Acquisition Regulations (DFAR) Subpart 8.70 and 8.71 of 15 August 1984. These rules are extensive, and are summarized as follows:

The lead agency should accept submissions of requirements from other agencies.

Items are not subject to procurement assignment until they have reached production stage.

When the exigences of the situation will not permit the delay incident to following the normal channels of coordinated procurement, purchases may be made without prior authorization of the procuring department. An "Urgency" statement must be filed.

When shortages develop, apportionment of items will be resolved on a departmental level based upon priorities. Disagreements are resolved by the Deputy Under Secretary of Defense for Acquisition Management.

Uncompleted contracts for non-lead procuring departments will not be transferred, but will be administered by the lead procurer.

A Military Interdepartmental Purchase Request (MIPR), or some other type requisition, will be used by non-lead departments to transmit requirements to the lead procurement department. Provisions for specifications, drawings, and initiation of options to increase quantities are available.

Exclusions to the rules are granted for emergent items (as determined by the requiring department), items in the RDTE stage, and items subject to rapid design change. This alternative should not be used for extended procurement.

Mr. **Murtha**. I assume the Navy observed all the rules?

Admiral **Holland**. We think we did, yes, sir.

Mr. **Murtha**. What is the situation today with regard to who is handling this contract for procurement of SINCGARS radios by the government?

Admiral **Holland**. The Army is managing that, sir. We are basically following their lead.

Mr. **Murtha**. In a situation where you have a lead procurement agency for the government, what are the rules for determining priority of distribution of the procured items?

Admiral **Holland**. The lead agency normally determines that, and generally in consultation with the followers. Since the Army is procuring so many more than we are, our voice will not be particularly strong in determining when we get ours relative to when they get theirs.

We were informed, however, at the time that we got into this business to supply these radios that the capacity of the company to manufacture the radios was such that our small number, 92, would be absorbed within that relatively easily.

Based on what I have just heard Mr. McDade do to General Powers, I am not so comfortable with that sort of situation.

Our small number of radios are for our Seal operations. They are generally a very high priority for that kind of thing, and we may have to now go find something else. But again, as General Powers explained, we are caught in the problem of interoperability, and because we have selected the VHF SINCGARS wave form, we are all stuck with that wave form and we can't go down to Radio Shack and buy a set that we need. We have to kind of stick with what the Army is going to get.

## UNIT LEVEL CIRCUIT SWITCH

Mr. **Murtha**. Going to unit level circuit switches, in fiscal year 1986 the Congress appropriated only enough funds to the Marine Corps and Air Force to procure four AN/TTC-42 switches for first article testing, and directed that further procurement of this switch should await completion of first article testing.

What is the status of the competitive procurement in fiscal year 1986 for the four first article test switches?

General **Winglass**. The competition is ongoing, sir, and we expect that there has been a proposal or an invitation for best and final offers to the participating vendors or contractors. We are anticipating that their reply will be received the 21st of this month, and at that point their responses will be subjected to the ordinary technical evaluations by a joint technical evaluation group since this is a joint program.

We would hope that if there isn't a problem with what I have described, that we would be in a position to award a contract to the winning vendor probably in late May.

Mr. **Murtha**. Is this the priority item for the Marine Corps last year? I remember they came to me right before the markup. Was this one of the priority items?

Admiral **Holland**. Yes, sir.

Mr. **Murtha**. It is going along fine, and you are not having any problems with it?

Admiral **Holland**. That is true.

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Mr. **Murtha**. It seems to me the staff was concerned there was a problem with it. You are saying you have overcome those problems?

General **Winglass**. If I might talk to that particular piece of equipment and hardware, I would like to refer to a couple of notes, because it is a very important program to us.

The unit—I have some notes here. Unit level circuit switch, in fact it is a joint program. It is part of the TRI-TAC architecture, and we are the lead agency for it, the executive agency for it, and have been for a number of years.

Participating with us and signed on to buy hardware is the Navy, the Air Force, and the Army has followed the program and has participated in the technical aspects of the requirements, because there is an interoperability challenge here that has got to be met by MSE as they work their way into this TRI-TAC structure.

There were some difficulties which led last year to the appropriations bill out of committee to authorize us to go forward with the procurement, the restricted procurement of sorts of only four independent items and they were to be subjected to a first article test. First article test, by the time that four systems are manufactured wouldn't occur until about 1990. So our people are concerned that that is too late to satisfy the operational requirement.

We would like to have this system brought on line and into production before that. We have a strategy that we have been dealing with in the OSD SECNAV arena and we are trying to work with staffs here on the hill to glean their guidance and see if we can't revise the strategy.

Mr. **Murtha**. I wish you would expand this for the record, because I don't want this to be kicked out and then we have to go back and put it back in the markup, because we are going to have a hard time putting anything back in.

Make sure that the staff understands if there is a problem before the markup.

[The information follows:]

Last year the committee was concerned about the ULCS's readiness for production in light of the Marine Corps Operational Test and Evaluation Agency (MCOTEA) Independent Evaluation Report (IER) which recommended that the AN/TTC-42 not be approved for service use and production based on a Limited Operational Test (LOT) conducted between Jan-Feb 1985.

After Development Test and Evaluation (DT&E) and Initial Operational Test and Evaluation (IOT&E) testing was concluded in December 1983 there were deficiencies noted in some of the performance aspects of the AN/TTC-42 and SB-3865. Generally, these deficiencies were divided 50-50 between hardware problems and software problems. In an effort to correct these deficiencies prior to production, the Marine Corps initiated a follow-on R&D program in June 1984.

Rather than reaching a production readiness decision on inconclusive information, the September 1984 MSARC III recommended that a Limited Operational Test (LOT) be performed by MCOTEA 3 months into the contractors 17 month effort to allow evaluation of the progress being made under the follow-on R&D contract.

The MCOTEA test report found that the SB-3865 (30-line switch) was ready for production and that the AN/TTC-42 (150-lone switch), was not ready, although it had shown some improvement since IOT&E.

Based on the February 1985 LOT test results and projections of work to be completed during the remaining 14 months of the follow-on R&D contract, the April 1985 MSARC IIIA was satisfied that the ULCS would be ready for production in FY86. Last year, Congress gave approval to go ahead with the SB-3865 but only funded the Marine Corps for 4 First Article AN/TTC-42's.

As the follow-on R&D tasks have been concluded it has become evident that the contractor has made substantial progress in correcting the total of 292 ULCS performance deficiencies noted during all previous testing. The Marine Corps has monitored the contractor's progress via demonstrations in the contractors facility. Although some corrections will not be evident until a production system is built, the contractor has made available analysis documentation that supports the known engineering fixes. Corrections are not considered closed until they successfully pass Government conducted testing.

In summary, all the ULCS deficiencies have been resolved through the execution of the follow-on R&D contract and the system is ready for low risk production.

## RELOCATABLE OVER-THE-HORIZON RADAR (ROTHR)

Mr. **Chappell.** Admiral, let me ask a couple of questions about the Navy relocatable over-the-horizon radar.

What do you mean by relocatable?

Admiral **Holland.** It moves but it doesn't move by itself or quickly. Its location can be changed. It would be a long row of equipments raised in the field, several square miles of land are required, but once in its location, it is not permanently fixed there as would be an Air Force over-the-horizon radar or a PARKS radar or BMEWS system. The system is in a van and has several small houses which are easily constructed and it is supplied by commercial power or diesel generator, so the original site located no longer has strategic value.

The systems will probably last ——— years.

Mr. **Chappell.** How many of these systems are you going to have?

Admiral **Holland.** We are funding nine in the FYDP and projecting not more than ———.

Mr. **Chappell.** Where will they be located?

Admiral **Holland.** Amchitka, the end of the Aleutian Islands, ———.

Mr. **Chappell.** What is the total cost of the system going to be?

Admiral **Holland.** A billion 84 million for the first ——— and that doesn't count necessarily the cost of the property.

Mr. **Chappell.** What is the IOC on it?

Admiral **Holland.** ———1988 we build the first one; ———.

Mr. **Chappell.** You have one built now?

Admiral **Holland.** No. We will put the one in Amchitka in this year. We will build the one in northwest, make sure it works, then put it in Amchitka.

We put the second one in the year after that. The money we are asking you for this year is for the Amchitka unit. So it will be ——— that that gets on line.

Mr. **Chappell.** Is this system affected by night?

Admiral **Holland.** Yes, because it is an HF system and it is an atmospheric system, affected by atmospheric conditions.

The degree to which it is affected, however, changes, and while it is not as effective at night as during the day, it certainly will meet all of our needs.

Mr. **Chappell.** It will meet all the needs?

Admiral **Holland.** Yes. We would like to have it even better than it is, but it will do the job we intend it to do, which is tell us about airplanes and ships.

Mr. **Chappell.** What is the range?

Admiral HOLLAND. It will be ——— miles. That is the area that is covered. It doesn't come right to you.

If you are in the first 200 or 300 miles, it doesn't see you because it is going up into the ionosphere and back down. It is looking at a piece of property ———.

Mr. CHAPPELL. How susceptible is it to electronic countermeasures?

Admiral HOLLAND. It is susceptible but it has ——— in order that the operator can change its characteristics to overcome jamming or spoofing.

Mr. CHAPPELL. Are there other assets that plan to be in place that would do the same job?

Admiral HOLLAND. No.

Mr. CHAPPELL. How about TEAL RUBY?

Admiral HOLLAND. That is an experiment, and that is a long way away and we don't believe that that will necessarily do the same kind of job, but even if it could, it has not even flown yet. We don't know whether the concept works.

There is some debate within the technical community if the mosaic steering technology will really work.

### NAVY REMOTE OCEAN SENSING SATELLITE (NROSS)

Mr. CHAPPELL. Let me turn now to the NROSS program. I understand we have two meteorological polar orbiting satellites at this time, is that right?

Admiral HOLLAND. Yes, sir.

Mr. CHAPPELL. Why can't we put both systems together? Why do we need two? We don't have two other systems.

Admiral HOLLAND. I am not sure that I understand what you are asking me. I think your basic question is, why does the Navy want its own system?

Mr. CHAPPELL. Right, but the Air Force's defense meteorological satellite program and the National Oceanic and Atmospheric Administration television infrared observation satellite system, these are the two systems, and both of those exchange weather data, and as I understand it, are similar in many respects.

As a matter of fact, I understand they are built by the same manufacturer.

Admiral HOLLAND. Yes, sir.

Mr. CHAPPELL. But they are separately procured. One is by the Air Force and one is by NASA. Several studies, including a June 1979 DOD, Department of Commerce, and NASA study recommended that data requirements could be satisfied by a single system at significant savings, yet the Navy is currently planning to procure separately the NROSS, and is likely to use the same or similar bus and some of the same sensors; it will have the same orbital characteristics, and the same launch, and command and control systems.

Why wouldn't it be more economical for the government to procure the NROSS requirements on the part of the Air Force for the DMSP system?

Admiral Holland. The other two measures atmospheric conditions, look at the earth above its surface, cloud cover and so forth. We need NROSS to look at the ocean.

Mr. Chappell. Why couldn't you put that on the same satellite?

Admiral Holland. Because they haven't built a satellite big enough to carry it all. We are going to compete the physical satellite so that the bus may look similar to DMSP. We are going to compete that and see what we get and try to save money.

We are not going to design a whole new satellite system.

Mr. Chappell. You say the main thing is the size of the bus.

Admiral Holland. Yes, sir.

Mr. Chappell. Why couldn't you modify that to a larger capability?

Admiral Holland. Because you are at the weight constraints for the launch now. When you shove it out of the shuttle, you have only so much weight that you can put on that bus.

As I understand it, DMSP, the follow-on, the present design is at that limit and does not carry all the devices that we want to have in order to measure sea surface temperature and sea surface wave height and wind speed, and we want to do that through the clouds. We want to look at the surface of the ocean through the cloud cover. That requires us to put up four basic sensors, of which only two are like the ones that are in DMSP, and we are limited in the size and the weight that we can throw into space. That is why we are going with our own device.

Should DMSP come along ——— and provide us that kind of information, then we have no reason to continue the NROSS program.

Mr. Chappell. You are familiar with that study, aren't you?

Admiral Holland. I have not read it, sir. I was not familiar with it until this morning.

Mr. Chappell. You haven't had a chance to check it out so I can't ask the question I wanted to ask you.

Admiral Holland. I can always get it for the record.

Mr. Chappell. For the record, tell us what parts of the study you disagree with, if any, and whether or not they took into consideration the difference in your requirements, your objectives and that of the Air Force.

Admiral Holland. Yes, sir, and we will provide that for the record, sir.

[The information follows:]

In June 1979, Secretary of Defense stated that DoD position regarding "Further Convergence of Polar Meteorological Satellite Programs." Navy has no objections to the position statement. Navy has worked closely with the Air Force and the National Oceanic and Atmospheric Administration (NOAA) during the intervening years to coordinate the reception and exchange of meteorological satellite data to support Marine Corps and Navy requirements.

It should be noted that the DoD position focused on meteorological not oceanographic or geodetic satellite requirements. Since 1979, Navy has initiated two environmental monitoring satellite programs to satisfy unique Navy requirements for geodetic and oceanographic data: Geodesy/Geophysical Satellite (GEOSAT) and the Navy Remote Ocean Sensing System (N-ROSS). Both programs are consistent with the National Space Policy (National Security Decision Directive Number 42) goal of strengthening national security. GEOSAT has performed flawlessly since it was launched in March 1985 and is providing Navy with important geodetic and oceanographic data to support its submarine forces. The first N-ROSS satellite will be launched in September 1990; it will provide deployed Naval units with real-time oceanographic data for a variety of warfare mission support areas.

Mr. **Chappell**. Put the rest of the questions on this subject in the record.

[**Clerk's note**.—Questions submitted by Mr. Chappell and the answers thereto follow:]

### NAVY REMOTE OCEAN SENSING SYSTEM (N-ROSS)

*Question*. Initially, the Navy planned to procure N-ROSS from the Defense Meteorological Satellite Program manufacturer taking advantage of existing Defense Meteorological Satellite Program designs for its bus and much of its electronic hardware. In the December 1985 Commerce Business Daily, however, the Navy issued a notice seeking sources to design and manufacture the N-ROSS, apparently intending to create competition. How much would be saved by competitive selection versus utilizing existing designs and hardware from a similar system such as Defense Meteorological Satellite Program?

Answer. Initially the Navy planned to use a NOAA-D spacecraft. When it became non-available, a modified Defense Meteorological Satellite Program spacecraft was a planning alternative. Commonality of electronics is limited by the different suite of sensors which need to be integrated. Competitve development is being pursued to determine if costs can be reduced for the sole-source approach. Competition does not in any way preclude use of those subsystems that are common with Defense Meteorological Satellite Program. Competition is not expected to cost more than a sole-source procurement approach. The Defense Meteorological Satellite Program spacecraft vendor is logically a strong competitor.

*Question*. What other reasons did the Navy have for seeking competitive sources?

Answer. Besides competing certain portions of the N-ROSS system for cost savings reasons, Navy wants to design a space-based system which satisfies Navy's unique need to observe oceanographic features on a global basis—even in cloud-covered regions. Competition provides Navy the opportunity to additionally evaluate industry's innovativeness and finest technical approach to best meet the stated requirement.

*Question*. It has been intended to have Air Force provide launch and command and control services for N-ROSS. What effect would selection of a separate manufacturer for N-ROSS have on the launch and command and control services that the Air Force was intended to provide for the Navy? What additional costs are involved?

Answer. No impact is expected—Navy plans to continue using Air Force launch services regardless of the spacecraft manufacturer. Use of Air Force command, control and data retrieval services is being strongly considered as an option. No additional costs are anticipated.

[**Clerk's note**.—End of questions submitted by Mr. Chappell.]

### EXTREMELY LOW FREQUENCY (ELF) PROGRAM

Mr. **Chappell**. Tell me quickly what the status of the ELF program is.

Admiral **Holland**. The transmitter in Wisconsin is on line. We expect a report of the test in June, and we have every expectation based on the informal results, which we know that it worked fine, we had a submarine at sea in the Pacific, and two in the Atlantic which were receivers and the signal appears to be well within the engineering specifications.

So when we get both transmitter sites on line, we expect it to work pretty well, as we advertise.

Mr. **Chappell**. Loud and clear?

Admiral **Holland**. Yes, sir.

Mr. **Chappell**. Mr. McDade, do you have questions?

Mr. **McDade**. Mr. Chairman, you have covered it.

Thank you, Admiral.

Admiral **Holland**. Thank you, sir.

Mr. **Chappell**. You don't want us to think about any further questions?

Admiral **Holland**. If you are through, I am through.

Mr. **Chappell**. General, do you have any questions you suggest we ask, or are you satisfied?

### ULCS

General **Winglass**. Following up on what Mr. Murtha asked about on the unit level circuit switch, I would like to say that last year we had language which suggested that the Marine Corps' Operational Test and Evaluation agency has recommended in fact at that time not to approve for procurement the unit level circuits which had been tested. We are working with the committee staff members here, representatives from the headquarters and other agencies, to revise the current stategy that we have on that program which is currently competitive procurement for four systems: the TCC-42, and unrestricted procurement of the SB-3865.

In any event, we are hopeful that together it will be possible to permit us to get into a procurement date before 1990. We have great confidence that the system is improving and has improved sufficiently enough that we can take perhaps a modified look at the extent of testing that is necessary. If that would be permitted, then we are hopeful that we can in fact secure and get congressional support of our 1987 program, Procurement Marine Corps and R&D, and get on with the procurement process.

This system has matured over the time line, and we are hopeful that such can be demonstrated by a test plan that we are going to suggest.

Other than that, I could only stress again the importance of the program. It is a joint program. We are the executive agency, and we think that it is a very meaningful program in the whole world of tri-tac architecture.

Mr. **Chappell**. General, thank you very much.

Admiral **Holland**. Thank you, sir.

Mr. **Chappell**. The rest of the questions will be put in the record.

[CLERK'S NOTE.—Questions submitted for the record and the answers thereto follow:]

### ELF (EXTREMELY LOW FREQUENCY)

*Question.* The Navy's ELF (Extremely Low Frequency) communications system will permit communications (albeit at a slow rate) to deeply submerged submarines.

How much is requested in FY 1987 for this project?

Answer. A total of $62654K is requested.

*Question.* Describe to the Committee the results of the ELF tests conducted in the past year.

Answer. Technical Evaluation was conducted July-September 1985. Tests were conducted on three submarines, 1 SSN and 2 SSBNs to evaluate the speed and depth performance of the ELF system and to demonstrate communications performance. It was concluded that each submarine would meet or exceed the objective of receiving ELF signals at the required speed and depth. Operational Evaluation was conducted November 1985–March 1986 and involved the Wisconsin Transmitter Facility, the Message Input Segment at K. I. Sawyer Air Force Base, COMSUBLANT, one Pacific SSN and two Atlantic SSBNs. Results have been submitted by participating commands to OPTEVFOR for analysis and the report is expected by the end of June. Informal feedback was that the ELF system worked well throughout the test.

*Question.* How robust—strong and clear—will the ELF signals be when received by deeply submerged submarines?

Answer. Based on results to date with the single site transmitter, the signal strength is strong and clear enough for US submarines to perform required missions.

*Question.* Full Operational Capability (FOC) is projected for the ELF system in FY 1988. Provide for the record how many submarines will have terminals at that time.

Answer. Installations are planned for a total of 47 SSNs and 33 SSBNs dependent upon hull availability and operational schedules.

*Question.* Will an EAM (Emergency Action Messages which are the control orders for firing nuclear weapons) be able to be transmitted over the ELF system?

Answer. No, due to message length limitation of the ELF system, EAMs will not be transmitted over ELF.

### SATELLITE LASER COMMUNICATIONS

*Question.* The Navy is currently pursuing a technology program with the Defense Advanced Research Projects Agency (DARPA) for the potential development of a satellite-to-submarine blue laser communications system. This potential communications system would be capable of delivering EAM's (emergency action messages which are the control order for firing nuclear weapons).

What progress has been made to date in this program?

Answer. SLC is still in a technology demonstration phase to be completed in 1988.

In preparation for ———.

Significant progress has been made in blue receiver technology that should allow a significant reduction in power requirements for a space-based laser. Many technical problems remain, however, in producing a candidate laser system which can operate in space.

*Question.* Provide for the record the projected program requested for FY 1987.

Answer. FY-87, $5.9M. This effort funds completion of technology demonstration as agreed to by DARPA and Navy.

*Question.* Do you have any "ball park estimates" of the projected costs of such a satellite system?

Answer. The initial R&D for the space, platform, and operations segments is expected to cost a minimum of $600M. Acquisition costs for land injection/operation sites, submarine receivers, and five satellites is expected to be approximately $3.4B.

*Question.* What are your projections of the survivability of such a satellite system considering the Soviets' present and probable future ASAT (anti-satellite) capability?

Answer. Survivability against ASAT would be highly dependent ———.

*Question.* Would the so-called "blue-green laser" communications satellite system have a large overall role in Naval Communications, or would its primary role be to transmit EAMs (Emergency Action Messages) if that should become necessary?

Answer. SLC would have a relatively small role in the overall scheme of Naval Communications. However, SLC will have a large role in communications to all submarines. SLC provides reliable communications to the strategic as well as tactical submarine forces. SLC may be used to (1) transmit mission-essential traffic, (2) provide submarine communications management, (3) deliver bellringer messages, and (4) deliver EAMs.

## TACAMO AIRBORNE COMMUNICATIONS RELAY SYSTEM

*Question.* What actions have been taken to improve the reliability of the existing TACAMO communications equipment, and to what extent have they been successful?

What is the Navy doing to improve the capability of getting messages from the Air force Airborne Command Post to TACAMO aircraft operating in the Pacific?

Initially, how many E-6As will be equipped with communications equipment transferred from the EC-130s?

Answer. The Navy has a series of funded TACAMO electronics modifications that will improve the interoperability of TACAMO aircraft with the Air Force Airborne Command Post (ABNCP) aircraft. These modifications include the KG-84, Enhanced VERDIN (a signal processing system), Compact VLF receiver, Multiple Satellite Access and Minimum Essential Emergency Communications Network (MEECN) message processing mode. Additionally, the Navy and Air Force are analyzing a joint development of a new airborne Solid State Power Amplifier (SSPA) and Dual Trailing Wire Antenna (DTWA) system. This will provide greater power transmission from the ABNCP, which will extend the connectivity to TACAMO. Fourteen of the 15 E-6As will receive the communications equipment that is currently in the EC-130.

*Question.* Funding for all 14 production E-6A aircraft is scheduled to be completed before delivery and operational testing of the research and development aircraft, including its communications suite.

What is the rationale for this level of concurrency?

What aspects of the program present the highest risk under this schedule?

Answer. Funding for only the first eight production E-6A aircraft will have been completed before delivery and operational testing of the research and development aircraft, including its communications suite. The E-6A program has been tailored to reduce acquisition time and cost with minimal risk. The E-6A engineering design is derived from mature and proven E-3/707 airframe using the commercial CFM-56 engine, and incorporating existing mission communications equipment. A detailed technical assessment has been completed and the results have identified the potential for spurious electronic interference by integrating the TACAMO Mission Communications Suite into the new airframe. These analytical efforts indicate risk management techniques are sufficient to ensure an overall low risk transition from development to production.

*Question.* The existing EC-130 aircraft fleet to be replaced by the E-6A will still have useful service life well into the 1990s. How does the Navy plan to utilize these aircraft?

Answer. TACAMO mission equipment removed from the EC-130's will be used to support the E-6A. We plan to reconfigure the EC-130 airframes for cargo and various support roles depending on requirements and remaining service life on an aircraft by aircraft basis.

*Question.* If the blue green laser technology becomes available in the early 1990s, would there be a need for the E-6A program at all?

A. What is the status of the blue green laser technology?

Answer. In light of the critical role the FMB force fulfills in strengthening our deterrence posture, it is essential that we develop and deploy redundant means to assure survivable and enduring communications to and from our strategic submarine force. Satellite Laser Communications is a future and complementary system that may be useful to communicate with submarines and other ships of the fleet. Because Satellite Laser Communications system is tied to ground terminals, it cannot provide the same degree of survivability that an airborne platform such as the E-6A provides. The FY 1987 budget request provides for technology efforts and development of concepts necessary to permit a decision on whether to proceed with such a system by the end of FY 1988.

[CLERK'S NOTE.—End of questions submitted for the record.]

WEDNESDAY, APRIL 16, 1986.

# AIR FORCE COMMUNICATIONS, COMMAND AND CONTROL

## WITNESS

COL. WILLIAM J. FOSTER, USAF, DEPUTY DIRECTOR FOR SPACE SYSTEMS AND C3I, DEPARTMENT OF THE AIR FORCE

## INTRODUCTION

Mr. CHAPPELL. The Air Force budget for command, control and communications will be presentd by Colonel William J. Foster, Deputy Director, Space Systems, C³, Deputy Chief of Staff for Research, Development and Acquisition.

Colonel Foster, your entire statement will be placed in the record. Please proceed.

## SUMMARY STATEMENT OF COLONEL FOSTER

Colonel FOSTER. Good afternoon, Mr. Chairman. I would like to take a few minutes just to show you some of our programs and the efforts of primary interest to the Air Force.

[Slide 1.] I am going to talk a little bit about our space systems including, strategic C³, strategic defense and our force enhancement.

## STRATEGIC C3

[Slide 2.] Our most important program that we see in the C³ area is MILSTAR. I will discuss a little bit about MILSTAR, broken into two segments: the space and mission control segment, and the terminal segment.

First, the DSCS program is an ongoing multiyear program. The Mission Essential Emergency Communications Network has our low-frequency programs and they complement MILSTAR as two systems whereby we control our forces. We are doing upgrades in Cheyenne Mountain Complex for the Tactical Warning Attack Assessment. It is mostly R&D, and we are doing modifications in our post attack command and control system, the EC-135 aircraft, called the PACER LINK program.

## MILSTAR PROGRAM

I will cover the ones that I have highlighted here.

[Slide 3.] (Secret.)

The MILSTAR program is $493 million for this coming year, and it is primarily in the satellite area. We will start to incrementally fund the third satellite this year. The first five MILSTAR satellites will be incrementally funded R&D satellites.

MILSTAR is the EHF all-service communications system where we will have ——— satellites on orbit to give us worldwide communications: very much the state of the art, and our best communications system. I think that is Mr. Latham's most important C$^3$ project.

The mission control segment upgrades the airborne command post and ground command posts that will be able to control the satellites and configure the communication segments. We will be launching the first satellite in early fiscal year ———.

One other point about MILSTAR. We are going to have MILSTAR dual integrated; it will be capable of flying both on the shuttle and on the Complementary Expendible Launch Vehicle, so we will not be single string with MILSTAR. [Slide 4.]

In the terminal segment, we have a large research and development portion. This is for development of the EHF terminals which will go into the ground command posts and on our airborne command posts and eventually on our Advanced Technology Bomber and also the B-1. We are going to do prototyping, which will be putting the engineering development model terminals onboard our EC-135.

This amount of money here goes for upgrading our present terminals, which are UHF, to give them better antijam capability. And we will be doing 13 EC-135s to give us very good UHF antijam capability.

Mr. CHAPPELL. What is your orbit on the satellite?

Colonel FOSTER. ———. We will put them in highly inclined orbits which will give them orbits that will give us that polar coverage.

Mr. CHAPPELL. Elliptical?

Colonel FOSTER. No, circular, but highly inclined. They will give coverage up to the polar area. But as the earth rotates, some will make figure-eights over the Atlantic but they will be very highly inclined orbits to give us the high latitude coverage required for a lot of users and for the bombers as they cross over the poles for the positive control.

## MEECN PROGRAM

The other port programs to complement MILSTAR is the MEECN program. There we have the low frequency and VLF system. Diversity Reception Equipment is a system which will be onboard the EC-135s, which will allow us to transmit from the EC-135 the emergency action messages much better than we can today.

The new system low frequency Miniature Receive Terminals will be on the bombers allowing the EC-135s to transmit emergency action messages to the MRTs. Also, there is going to be a joint program for a high-power transmitter improvement and dual trailing wire antenna.

You have seen on the airborne command post and the Navy TACOMO aircraft the trailing wire antennas. We are going to develop another system, a modern system, because the present one does not have enough power and experiences a lot of failures. This will be a state-of-the-art development and will be a joint program with the Navy.

[Slide 5.] The GWEN program is under development. The picture here in our less-than-300-foot tower. This is the system you mentioned a little bit earlier. We plan to procure 127, ground nodes. In our FY87 request we plan on buying 56 of our ground terminals and the towers.

### STRATEGIC DEFENSE

[Slide 6.] Programs we have as part of our strategic defense efforts are the OTH-B and the ———. The DEW Line, or Distant Early Warning Line, we are going to continue upgrading. I will show you a picture of that, and the Ballistic Missile Early Warning System, which we are also upgrading. There is an upgrade at Tule, and we expect to start upgrading the Ballistic Missile Early Warning System at Fylingdales, England.

[Slide 7.] You can see these different sectors. We have already bought these three sectors of the OTH-B radar. That is the eastern system, in Maine.

This year we are buying this sector of the west coast system, and our request for fiscal year 1987 is for these two sectors.

There will be a total of 12 sectors. In fiscal year 1987 here and 1988 we are going to buy these two sectors. We will start in Alaska in 1989 and 1990 and complete the central radar by 1991 and 1992. ——— we will have a full operational capability with the 12 sectors.

The north warning system which we will have across the north by ——— will complete a system about the U.S. for atmospheric defense.

For the OTH-B, $188 million procures the two sectors on the west coast.

### AIR DEFENSE

Mr. McDade. Can I stop you for a minute?

The last slide showed a very ambitious, expensive system of putting into place for air defense and surveillance?

Colonel Foster. Air-breathing defense.

Mr. McDade. What are we going to defend with? I understand it is our policy to pull down that air defense component. What are you going to defend with?

Colonel Foster. We have a fighter competition between the F-20 and the F-16C. This would give us the warning and give NORAD and Space Command the warning that they would require.

Mr. McDade. How much warning are you going to get, Colonel?

Colonel Foster. The warning here—if it is an air breather, and it is 500 to 1800 miles, probably at 600 knots, you would have two to three hours.

Mr. McDade. Let's go to the Yankees sitting off the coast.

Colonel Foster. They would be several hundred miles.

Mr. McDade. What is the time?

Colonel Foster. The time line the intelligence estimates say that the Yankees will be further off the coast, and they are all moving further out as the longer range missiles become operational.

Mr. McDade. We don't have an air defense today, is the long and short of it, is that right?

Colonel Foster. We do have some air defense fighters; but this is for radar warning only. If you get warning when inbound, it gives you time and allows you to flush bombers and tankers. It is a warning system only for now.

We don't have enough fighters to go out and intercept a large raid.

Mr. McDade. What is the cost of the components to go down the west coast there? You said there are two areas on the west coast?

Colonel Foster. These two here, $188 million.

Mr. McDade. How much is left to spend on the system?

Colonel Foster. Probably about 100 million per sector.

Mr. McDade. How much have you spent on it to date?

Colonel Foster. About $500 million.

Mr. McDade. Do they represent the—the $500 million is the large pie shape on the right?

Colonel Foster. These right here and this over here plus all the R&D. I don't know exactly how much it is. That will be on the next chart.

Mr. McDade. Okay. Thank you.

Colonel Foster. [Slide 8.] Next chart, please.

Here is the money we are planning to spend for the sectors this coming year. What we are doing with the research and development during this year is testing against very small vehicles, testing against cruise missiles, and we will be doing that during 1986 and 1987. This is the 1987 portion here.

### DEFENSE SUPPORT PROGRAM

[Slide 9.] ———.

Mr. McDade. How much do we spend on that program? How much is the sunk cost?

Colonel Foster. [Slide 10.] The next chart would show that. It is in the billions. Almost $4 billion here so far.

Mr. McDade. So far, yes.

Colonel Foster. And over here you can look at the total going out through the POM years is $7 billion.

Mr. McDade. Thank you.

Colonel Foster. This year, we are requesting to start a multiyear for five satellites for is the price of four with a cost avoidance of $329 million. That will be a multiyear request that we have coming over to you.

We are going to upgrade our terminals so they can be more survivable and pick up the new signals out of the advanced satellites that we have, ———. Our request is almost $500 million in procurement for this year.

### FORCE ENHANCEMENT SYSTEMS

[Slide 11.] In our Force Enhancement Systems, we have the Global Positioning System which is our navigation system, 21 satellites, 18 satellites on orbit plus three spares. The Defense Meteorological Satellite Program is also an Air Force program. We are in a multiyear for that also, as well as the NUDET detection system, which detects nuclear detonations within ——— anywhere on earth.

## NAVSTAR GLOBAL POSITIONING SYSTEM

[Slide 12.] This is the Global Positioning System. We are in a multiyear right now. We went into a multiyears for 28 satellites and it was one of the best multiyears that the government ever got involved in.

With 28 satellites, Rockwell has an assembly line of satellite production. Satellites have always been hand-made and now at the Rockwell plant, it is a real assembly line with 28 satellites.

We are going to be launching these on the shuttle. We have a shuttle problem for launching them right now. They are a lower priority payload because they are a navigation system rather than a warning system, but they are still high on the list for early shuttle flights. We are also planning to make these dual compatible so they can be launched on a new medium expendable launch vehicle, which we would compete, and we will come over with our plan for that.

Mr. CHAPPELL. How precise is this located?

Colonel FOSTER. Fifteen meters anywhere on earth spherical. Latitude, longitude, and altitude we could tell you within 15 meters where you are. It is an excellent system. We use it for bombing also. It has been a highly accurate system in all its test programs.

Mr. CHAPPELL. How come we have so much error in it?

Colonel FOSTER. We need more satellites on orbit, sir. We cut the system down from 24 to 18 satellites on orbit or it would have been closer. At times we can get better capability, but if you are flying it should be good enough—it's better than anything we have today.

Mr. MCDADE. We all know we have a problem with the shuttle.

Colonel FOSTER. Yes.

Mr. MCDADE. And we don't know when or what is going to happen with that program. It impacts on this one pretty heavily, doesn't it?

Colonel FOSTER. It impacts on GPS, yes, but with a—NASA said a 12-month downtime, but 18 is the longest I have heard. We intend to start launching these in fiscal year 1987.

## IMPACT OF SHUTTLE DELAY ON NAVSTAR BUDGET

Mr. MCDADE. We all have a problem. What I was going to specifically ask you about was whether or not the budget has been changed to reflect what happened in the Challenger, the unfortunate accident.

Colonel FOSTER. The budget for that satellite program?

Mr. MCDADE. Yes.

Colonel FOSTER. We are in a multiyear. We are buying 28 of them in 1987, and it would break our contract to change the budget on that. Twenty-eight satellites for $1.2 billion.

Mr. MCDADE. What about the receivers?

Colonal FOSTER. The receivers are moving right along with low rate initial production starting this year. We are having a little bit of a problem with reliability of the receivers, but we are working with the contractor right now.

We are going to have a low-rate initial production. We are going to keep it at a low rate, establish a solid reliability program, and have an analyst retest the receivers and then go to full rate production in fiscal year 1989.

**Mr. McDade.** Is that part of the contract?

**Colonel Foster.** No, two different contractors.

**Mr. McDade.** I was going to ask if that contract for the receivers is in any way reflecting what happened to the Space Shuttle.

**Colonel Foster.** It is not.

**Mr. McDade.** Are you allowed to test them before you get them up there?

**Colonel Foster.** We will not have that many terminals available to test before fiscal year 1988. We have seven satellites up there right now as part of this system, the research and development satellites.

**Mr. McDade.** You will be testing the receiver and put them right to work, the Shuttle will not impact it?

**Colonel Foster.** No. The Shuttle will impact the launches. But we will have sufficient satellites in place to support the user equipment effort. We could fit three of these satellites on the shuttle if we launched them all together. If we launch them on an expendible launch vehicle, it is one at a time.

We have seven GPS satellites up now in a cluster. We are using them for Trident missile test launches, and for user equipment testing. It is working very well right now.

**Mr. McDade.** The receivers will work up there, will they?

**Colonel Foster.** They sure will.

**Mr. McDade.** Thank you.

[Slide 13.]

## SPACE SYSTEMS MULTIYEAR PROCUREMENT

**Colonel Foster.** Mr. Chairman, what I would like to show you with this chart here is we have four miltiyears in progress right now. We have had quite a bit of savings or cost avoidances on these multiyears and coming over in 1987, we have the Defense Support Program, which is the five satellites for the price of four, with our projected savings, a cost avoidance of $329 million.

Another one which is not a C3 Program, is the Complementary Expendable Launch Vehicle, we have a multiyear here now to buy 10 of these. That is our request and that will be a $380 million cost avoidance, if we bought those 10 with multiyear. Since there are only three arbiters, we will need even more of the CELV's to keep up with our national defense payload.

That concludes my presentation. I will be glad to answer any questions.

[The unclassified slides used by Colonel Foster and his prepared statement follow:]

# OVERVIEW

- SPACE LAUNCH AND OPERATIONS
- STRATEGIC COMMAND, CONTROL, COMMUNICATIONS
- STRATEGIC DEFENSE
- FORCE ENHANCEMENT

[redacted]

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[illegible] SATELLITE COMMUNICATIONS [illegible]
SPACE AND MISSION CONTROL

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Slide 3

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Slide 4

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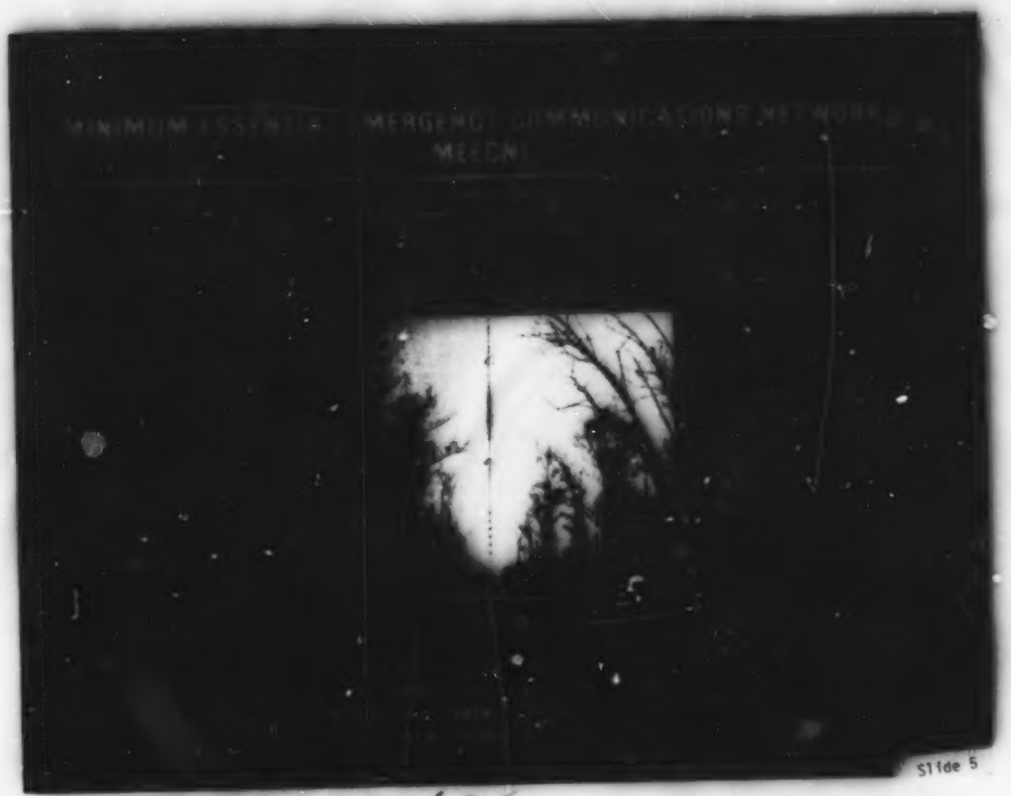

MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK (MEECN)

Slide 5

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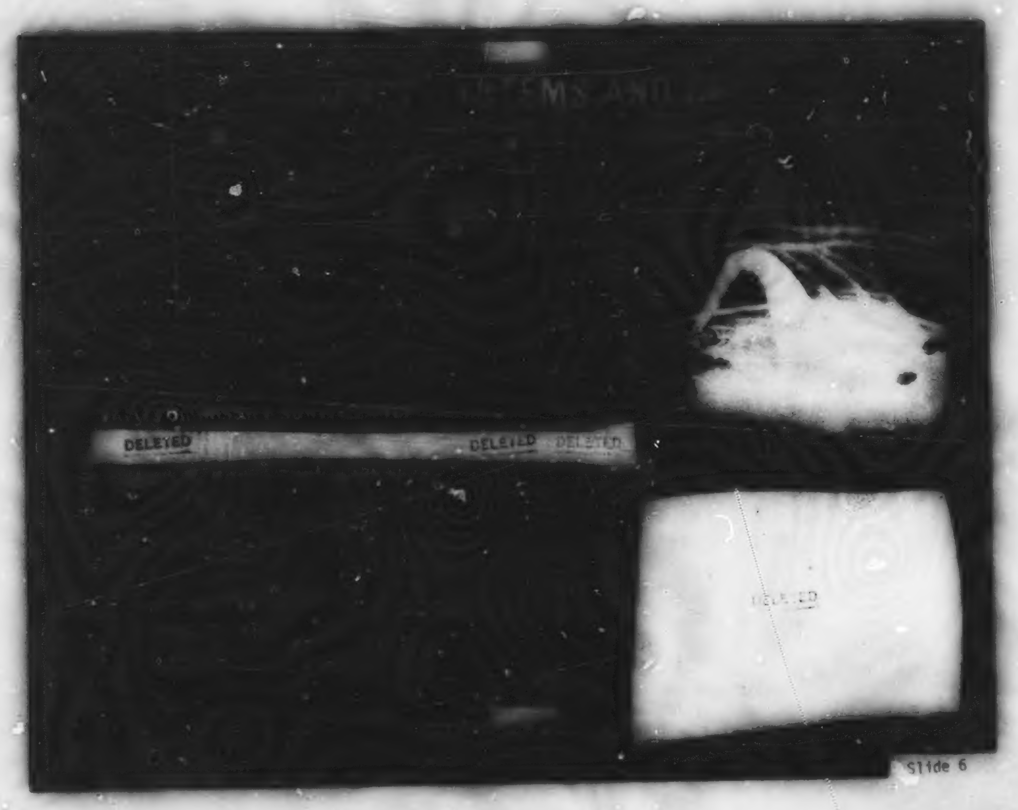

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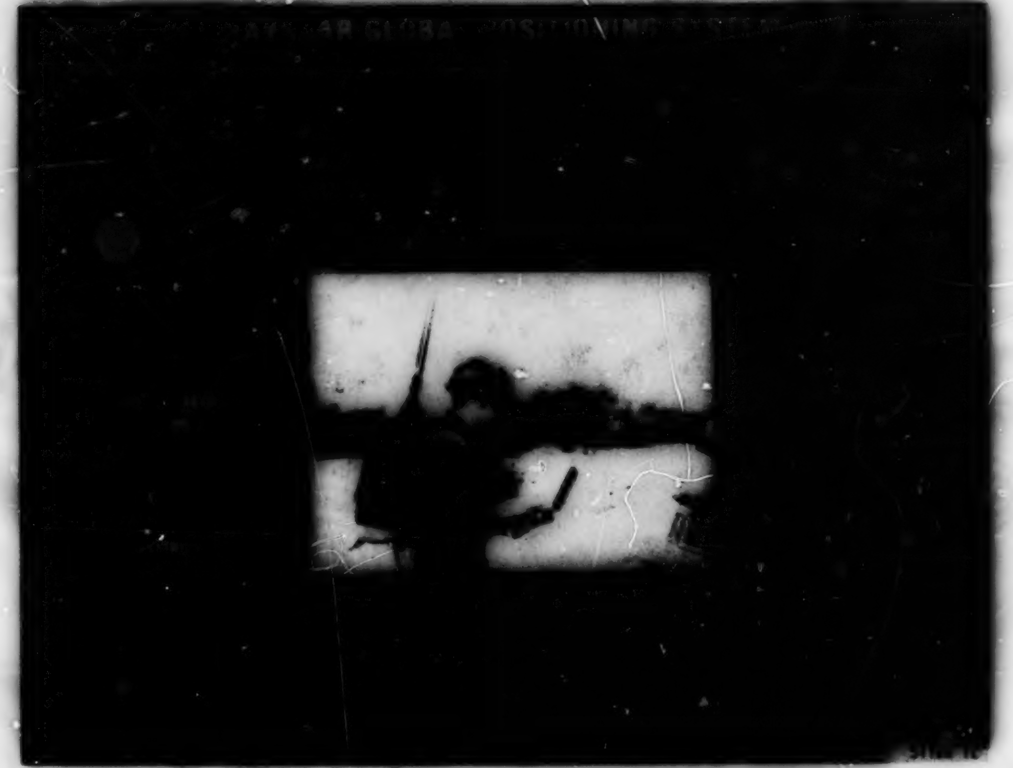

NAVSTAR GLOBAL POSITIONING SYSTEM

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# SPACE SYSTEMS MULTIYEAR PROCUREMENT (MYP)

($ IN MILLIONS)

MYP APPROVED BY CONGRESS

| PROGRAM | FY START | QUANTITY | SAVINGS |
|---|---|---|---|
| NAVSTAR GPS | 82 | 28 | 212 |
| DSP (EOQ) | 82 | 4 | 62 |
| DMSP | 83 | 4 | 58 |
| DSCS III | 84 | 7 | 140 |
| | | REALIZED SAVINGS | 472 |

PROPOSED MYP

| PROGRAM | FY START | QUANTITY | SAVINGS |
|---|---|---|---|
| DSP | 87 | 5 | 329 |
| CELV | 87 | 10 | 380 |
| | | POTENTIAL SAVINGS | 709 |

[redacted]

## STATEMENT BY THE DEPUTY DIRECTOR,
## SPACE SYSTEMS AND $C^3$

MR CHAIRMAN AND MEMBERS OF THE COMMITTEE:

Thank you for the opportunity to talk to you today on Air Force Command, Control, Communications ($C^3$) requests for FY 1987. The budget you have before you maintains our current $C^3$ capabilities and continues the President's modernization efforts. While space and ground based systems are often addressed separately, in reality, they are highly interdependent in accomplishing the broad spectrum of DOD missions and responsibilities. This interdependence can best be illustrated by examining three broad mission areas of our FY 1987 request: Strategic $C^3$, Strategic Defense and Force Enhancement. However, before I begin first let me review our objectives in space, missile procurement funding trends, and the role of multiyear procurement in our space and $C^3$ programs.

### OBJECTIVES IN SPACE

Current Air Force space systems perform and support a variety of $C^3$ functions such as navigation, communications, surveillance, tactical warning, treaty monitoring, and weather observation. Both our strategic and conventional forces rely directly on space systems to perform their missions. The global access provided by our satellites coupled with their efficiency in terms of mission and cost are the primary reasons for our space activity.

To consolidate and direct our nation's space activities, the President in July 1982 issued a new national space policy directing a balanced civil and national security space program. As part of the national security program the Air Force established the Air Force Space Command, a new major command, to centralize and manage our operational space activities. In September 1985, the the new unified U.S. Space Command was activated.

Air Force objectives in space include pursuing a vigorous research and development program to give us future options in space; providing an expendable launch vehicle to complement the Shuttle for assured access to space; improving the reliability, maintainability, and supportability of our space assets. Additionally, we are concentrating our efforts on doing more with each launch by deploying multiple mission satellites with much longer operational lives.

### SPACE AND $C^3$ PROCUREMENT TRENDS

The following table summarizes the Air Force missile procurement request for space systems and $C^3$ from FY 1982 - FY 1988 (then year dollars in millions):

| FY 82 | FY 83 | FY 84 | FY 85 | FY 86 | FY 87 | FY 88 |
|---|---|---|---|---|---|---|
| 755 | 1205 | 1151 | 1160 | 962 | 1026 | 1525 |

In FY 1986 the Air Force missile procurement request for space programs was \$962 million. Our FY 1987 request is \$1026 million and in FY 1988 we plan to request the \$1525 million level. The primary reasons for this trend are the phasing of the major satellite procurements and the activation of the Vandenberg Air Force Base (AFB) Shuttle launch and landing site. During the FY 1982 - FY 1984 timeframe we initiated multiyear procurements for the Navstar Global Positioning System (GPS), Defense Support Program (DSP), Defense Meteorological Satellite Program (DMSP), and the Defense Satellite Communications System (DSCS) program. At the same time we were investing in the Vandenberg facility which became operational during FY 1986. The DSCS and GPS multiyears are still ongoing in FY 1986; however, we did not request additional funds for DMSP and DSP satellites in FY 1986.

In FY 1987, you will see a significant increase in the DSP program to buy replenishment satellites and in FY 1988 the same will occur for DMSP. Also, in FY 1988 we plan to continue funding for the DSP and Complementary Expendable Launch Vehicle (CELV) programs. This will cause a significant then year dollar increase to our space program budget from FY 1987 to FY 1988. However, converting from then year to common base year 1982 dollars, you will see an interesting result that is summarized in the following table (dollars in millions):

| FY 82 | FY 83 | FY 84 | FY 85 | FY 86 | FY 87 | FY 88 |
|---|---|---|---|---|---|---|
| 673 | 1008 | 921 | 895 | 711 | 726 | 1038 |

Although FY 1987 to FY 1988 will represent a significant increase, the FY 1988 request will give us approximately the same buying power as our FY 1983 request.

MULTIYEAR CONTRACTING

Before I proceed into the details of Air Force space and $C^3$ programs, I want to point out the critical importance of multiyear procurement for our satellites and launch vehicles. Our past multiyear procurements for space systems have been responsible for significant cost savings. Because we buy satellites and launch vehicles in small quantities, multiyear procurements minimize the set-up to run ratios for production. We can also save a significant amount in procurement of materials and components which all have to meet stringent reliability specifications. Multiyear contracting permits important program stability, which is an absolutely critical ingredient to acquisition cost reduction.

An excellent example of the benefits of multiyear contracting is the GPS acquisition. GPS is in the fifth year under a multiyear contract for 28 satellites that will result in a cost avoidance of $212 million. In addition, the Navstar contractor, Rockwell International, as well as several of Rockwell's subcontractors, have invested over $420 million in productivity enhancements and facilities expansion as a result of the multiyear commitment. Their entire production line was redesigned from start to finish which produced dramatic improvements in manufacturing efficiencies. Additionally, Rockwell built new test facilities which, when combined with the production line modification, made Rockwell a much more effective competitor for future spacecraft development contracts.

Other examples of successful multiyear contracts include DMSP for four satellites with a cost avoidance of $58 million; DSCS III procurement that was started in FY 1984 for seven satellites with a cost avoidance of $140 million; and the modified multiyear (FY 1982 - 1985) procurement of four DSP satellites with a cost avoidance of $62 million.

In FY 1987, we have requested Congress to approve new multiyear efforts for two critical programs - DSP and CELV. Collectively, these two multiyears will result in approximately $700 million in cost avoidance.

STRATEGIC COMMAND, CONTROL, COMMUNICATIONS

The capability of the U.S. nuclear forces to deter attack depends upon the Soviet's perception of their own capability to successfully launch a first strike. Through our strategic command, control, communications ($C^3$) systems, we report events that are critical to the survival and employment of both our strategic and conventional forces. Strategic $C^3$ systems provide the link from the National Command Authority, through the JCS to the Unified and Specified Commanders of U.S. nuclear retaliatory forces.

Milstar will provide worldwide, two-way, secure, highly jam-resistant, survivable and enduring voice/data communications. This multi-service system will enable the President and the Commanders-in-Chief to direct strategic and tactical forces through all levels of conventional and nuclear conflicts. Milstar is a crucial part of the President's strategic modernization program and has been designated as a program of the highest national priority.

Currently the Air Force depends on the Air Force Satellite Communications (AFSATCOM) system for long range strategic communications. This ultra-high frequency (UHF) system has very limited jam resistance and physical survivability. Milstar will operate at extremely high frequency (EHF) and will provide a much more survivable and enduring communications capability while significantly increasing the number of available communications channels. The Air Force is responsible for the satellite, now in detail[illegible] RDT&E design phase. The Navy and Army are responsible for sea-going and mo[illegible] Milstar satellite communications ground terminals, respectively. The Air Force is responsible for all airborne and some ground terminals.

The Minimum Essential Emergency Communications Network (MEECN) consists of communications systems specifically designed to operate during a nuclear attack and to provide a communications capability for the dissemination of nuclear execution and termination orders during various phases of conflict. The MEECN program has two major efforts - the Ground Wave Emergency Network (GWEN) and the very low frequency/low frequency (VLF/LF) improvement program.

The GWEN program is also a part of the President's strategic modernization program and will provide assured communications between the national command authority, major command centers, missile warning sites, and U.S. based nuclear forces. Survivable communications are provided through a network of radio relay stations that interconnect user terminals at those locations. Full scale development of the prototype network, including relay stations, input and output ground and airborne terminals, and receive-only terminals, began in FY 1983 and will continue into FY 1986. During FY 1986, prototype network testing will be concluded. In late FY 1986, we will also conduct initial initial operational test and evaluation of the GWEN network. In FY 1987, we will continue missile and airborne terminal prototyping and begin development of portable receive-only terminals. We will also begin production and installation of the relay node stations in FY 1986. Full operational capability of the complete system is scheduled for FY 1992.

The MEECN system also ensures delivery of critical messages under stressed conditions. Current projects will upgrade or provide new equipment required for improved dissemination of emergency action messages through long-range survivable, secure data communications. In FY 1987, we will continue the development of Diversity Reception Equipment (DRE) for deployment aboard worldwide airborne command post aircraft and at selected ground sites. This new equipment will upgrade and replace existing equipment in both ground and airborne transmit and airborne receive applications. Communication range, message accuracy, and transmission time will be greatly improved. Also, development will continue for the very low frequency/low frequency (VLF/LF) Miniature Receive Terminals (MRT) for bomber aircraft. These receive terminals will provide a new communications link for bombers that will be unaffected by atmospheric disturbances. In FY 1987, full scale development will continue and flight testing will begin on the Miniature Receiver Terminals. Full scale development of a higher power transmitter/trailing wire antenna system will begin and development of our current survivable low frequency communication system will continue.

The EC-135 airborne command post provides an airborne operations center for survivable command and control of our nuclear forces. These aircraft, along with E-4B National Emergency Airborne Command Post (NEACP) aircraft, form the basis of the Worldwide Airborne Command Post (WWABNCP) system.

With the increasing age of the EC-135 Post Attack Command and Control System (PACCS) aircraft and the national emphasis on strategic communications capabilities, the Air Force has developed plans to modernize these aircraft. Additionally, we are currently conducting studies and preparing an acquisition plan for phasing in a replacement system. Major modifications are planned for the EC-135 aircraft in FY 1987. These modifications include continuing the ultra-high frequency/frequency division multiplex replacement, the initial transition to Milstar satellite communications terminals and the Peacekeeper upgrades to airborne launch control center aircraft. Other enhancements to be programmed in subsequent years include the full Milstar capability, GWEN terminals, improved low frequency/very low frequency radios and antennas, and installation of the Nuclear Detonation Detection System terminals. Also in FY 1987, we will begin installation of several classified communications systems for the E-4B command post aircraft. The E-4B will also receive the initial Milstar modification as well as Nuclear Detonation Detection System terminals, GWEN terminals, and the improved low frequency/very low frequency equipment.

Finally, DSCS provides super high frequency (SHF) satellite communications for secure voice and high data rate transmissions to support both defense and diplomatic users. In FY 1984 we initiated an expanded advance buy of parts for seven DSCS III satellites. The FY 1985, 1986 and 1987 budget requests provide full funding for two satellites each year and continue advance procurement for the remaining vehicles.

STRATEGIC DEFENSE

Strategic defense forces and systems are key elements of our deterrent posture. They form the backbone of our ability to warn of aircraft and missile attacks, monitor space activities, and defend against atmospheric and space-based threats to U.S. forces. They insure that our National Command Authority's strategic retaliatory capability will survive any Soviet attempt at a first strike by providing timely, reliable, and unambiguous warning as well as attack assessment and ultimately damage limitation.

The Over-the-Horizon Backscatter (OTH-B) radar will provide tactical early warning of an attack on North America by bombers and cruise missiles through long-range, all-altitude, wide-area surveillance of the coastal approaches to North America. It increases warning time for survival of the strategic retaliatory forces and provides decision time consistent with ballistic missile warning requirements.

The Air Force plans to deploy four OTH-B radar systems. The East Coast system will provide surveillance of the Atlantic from the Labrador coast (where it links to the DEW line replacement, the North Warning System) to Florida. The initial sector of the East Coast radar system will be delivered to the Air Force in FY 1986. The remaining two sectors will be delivered in FY 1987. The West Coast radar system will provide surveillance of the Pacific Ocean area from Alaska to Mexico. Procurement of the West Coast system will occur in FY 1986 and 1987. The Central system will link the East and West OTH-B radar systems. It will provide surveillance of the southern approaches to the United States and will cover Atlantic and Pacific Ocean areas inside the 500 mile minimum range of the East and West Coast systems. Deployment is scheduled in the early 1990s. The North Pacific or Alaskan system will provide surveillance of the Aleutian Islands. The system will be deployed in the early 1990s.

The North Warning System (NWS) program replaces Distant Early Warning (DEW) line radar stations. The 31 existing DEW line radars are old, expensive to operate and maintain, and deficient in coverage and radar performance. The NWS will provide credible long range all altitude coverage to complement OTH-B surveillance. Its mission is to provide reliable, timely northern tactical warning of a bomber or cruise missile attack on North America.

The North Warning System will consist of a total of 52 radar stations: thirteen long range, minimally attended radars and 39 short range, unattended radars. Upgraded communications to interconnect the radar stations and transmit data to the Joint Surveillance System Region Operations Control Centers are also part of the new program. Development of the new short range radar began in 1984, while production of the long range radar is continuing. Field deployment and site construction are being done under a new joint venture with Canada. In FY 1987, communications upgrades and development of the short range radar stations will continue. Both the OTH-B and NWS radars will provide a capability to detect and track long range cruise missiles as well as improve supportability and reliability.

The Defense Support Program (DSP) is critical to our nation's strategic defense posture. This program provides data to the National Command Authority, North American Aerospace Defense Command, and Strategic Air Command. Our development efforts are aimed at increasing the survivability of operational data through design of ground station modifications. These stations will be made compatible with the survivability improvements of follow-on satellites.

To meet near-term requirements, four DSP satellites were procured: two in FY 1983 and two in FY 1984. In FY 1986, we will take delivery of the first of these satellites; continue ground station compatibility modifications, and complete testing on all mobile ground terminals. In FY 1987, we plan to initiate the multiyear procurement for the next block buy of DSP satellites. A minimum of five satellites will be needed to maintain the constellation to the middle 1990s. Projected multiyear savings for these satellites are $329 million, over a 20 percent savings compared to annual contracting. FY 1987 will also continue research and development with primary emphasis aimed at minimizing/eliminating operational employment deficiencies and vulnerabilities; ensuring a launch capability through the use of either the Complementary Expendable Launch Vehicle or the Space Shuttle; the development of a more survivable DSP system through upgrades to the Mobile Ground System and satellites, and insuring adequacy of ground station data processing capabilities.

The integrated ballistic missile tactical warning and attack assessment (TW/AA) system provides accurate, timely and unambiguous warning and assessment information to support force survivability and national decision making. Ballistic missile TW/AA sensors provide warning of missiles launched from all fixed-site Soviet intercontinental ballistic missile launch areas and areas historically patrolled by ballistic missile submarines in the northern hemisphere. These sensors include satellite systems; Ballistic Missile Early Warning System (BMEWS) sites in Alaska, Greenland, and the United Kingdom; the Perimeter Acquisition Radar Attack Characterization System (PARCS) radar in North Dakota; sea-launched ballistic missile detection and warning sites (PAVE PAWS) in Massachusetts and California, and the AN/FPS-85 and AN/FSS-7 sea-launched ballistic missile detection radars in Florida. However, Soviet ballistic missile capabilities have improved to the point that we must upgrade our existing radars and deploy new sea-launched ballistic missile (SLBM) warning systems to ensure adequate coverage and meet the modern, multiple reentry vehicle long range threat.

To accommodate the increased Soviet sea-launched ballistic missile threat, two new PAVE PAWS radars are now under construction in the southeastern and southwestern United States. When these sites become operational, they will join the existing Northeast and Northwest PAVE PAWS radars and the PARCS radar in North Dakota to form a five site phased array SLBM radar-warning network. This network will provide 360 degrees of warning coverage around the United States, and also allow us to close the older, less capable AN/FPS-85 and AN/FSS-7 radars currently in use. In FY 1987, efforts will continue on these new PAVE PAWS radars at Robins Air Force Base, Georgia, and Goodfellow Air Force Base, Texas. Warning capability improvements will also be added to existing PAVE PAWS radars at Otis Air National Guard Base, Massachusetts, and Beale Air Force Base, California.

The BMEWS modernization program is replacing existing 20 year old conventional radars at Thule Air Base, Greenland site with a new solid-state phased -array radar. The new system will become operational in late 1986. This will improve system performance and capacity and provide better pre-impact assessment. In FY 1986, we plan to start a similar modernization program at the Fylingdales, England site. In FY 1987, upgrade of the Thule site will be completed and an initial operational capability achieved. Software development, system engineering and equipment fabrication will continue on the Fylingdales upgrade effort.

FORCE ENHANCEMENT

U.S. space systems significantly enhance the effectiveness of our ground forces. The global coverage and critical near real-time information that satellites provide are becoming increasingly more important. In fact, many of the tasks performed by our satellites can only be done effectively from space. Three Air Force space programs, the Defense Meteorological Satellite Program (DMSP), the Navstar Global Positioning System (GPS), and the Nuclear Detonation (NUDET) Detection system perform a broad spectrum of missions for the DOD.

The Defense Meteorological Satellite Program (DMSP) is DOD's single most important source of weather data. DMSP is a Joint-Service program with the Air Force serving as executive agent. DMSP provides total earth coverage of meteorological, space environmental and oceanographic data to Air Force and Navy forecasting centers. In addition, it directly transmits realtime cloud imagery data to Air Force, Navy, and Marine Corps fixed and mobile terminals and Navy aircraft carriers. The major FY 1987 effort will be the continued development of the Block 5D-3 Titan II Space Launch Vehicle qualified spacecraft. Production of the new Mark IV advanced mobile tactical transportable weather terminals for the Air Force and Marine Corps will continue. Integration of command and control hardware into the DMSP Fairchild Satellite Operations Center will also begin.

The Navstar Global Positioning System (GPS) is a space-based radio navigation system which will provide joint service users highly accurate three-dimensional position and velocity and precise time under all weather conditions on a worldwide basis. GPS will significantly improve the probability of target acquisition, low-level navigation to and from the target, flexible routing and, most importantly, accuracy of weapons delivery. In addition, GPS will also be available for worldwide civil use.

The GPS system includes a space segment, a control segment, and user equipment. Successful development led to the award of a multiyear production contract for 28 satellites in FY 1982. The multiyear contract remains within the cost, schedule and performance parameters approved by Congress. The last GPS development satellite was launched on October 8, 1985. The FY 1987 procurement funds will be used to purchase eight satellites to continue the GPS multiyear contract and to procure and install user avionics on DOD aircraft. Also included is RDT&E funding to support the seven-satellite research and development constellation, which includes mapping, missile testing and avionics integration testing activities. User equipment production will continue at a low rate production level with first deliveries planned for early FY 1988.

The NDS, previously called as the Integrated Operational NUDET Detection System (IONDS), consists of a set of sensors that will be carried on Navstar GPS satellites. When used with the precision frequency standards of the GPS, these sensors will determine nuclear detonation location, time and yield. Prototype NDS sensors are operational on three GPS development satellites. In FY 1987 we will continue development and test of the NDS user terminals and acquisition of the operational satellite segment.

Mr Chairman, this concludes my remarks.

## GROUND WAVE EMERGENCY NETWORK (GWEN)

Mr. **Chappell**. Let me ask you some questions about GWEN. If you need to amplify or add to them, be sure you do so very carefully.

The budget backup book supplied to the committee indicates that GWEN consists of a communications system specifically designed to ———.

The issue of whether GWEN reflects the view that a "protracted nuclear war is feasible" has become very controversial. Please explain to the committee how the statement in the budget back-up book fits with the policy statement in the Air Force fact sheet that says flatly that GWEN is not meant to be used to fight a prolonged nuclear war.

Colonel **Foster**. Sir, the GWEN program is not designed to survive a blast effects from an attack. The GWEN program, as we look at it, is a deterrent. With this deterrent, the Soviet Union would know that with our communications we do have a capability to survive through an EMP attack.

Therefore, we believe that we are not seeking to fight a prolonged nuclear war. What we are doing is to deter a nuclear war with the GWEN program.

[Additional information provided:]

The budget backup book describes the Air Force support to the Minimum Essential Emergency Communications Network (MEECN) System, which consists of two projects, Very Low Frequency Low Frequency (VLF LF) system improvements (such as Miniature Receive Terminals (MRT) for bombers) and the GWEN system. The VLF LF systems are designed to operate as long as the weapon systems survive. For example, the MRT is designed to operate during the pre-, trans- and post-attack period as long as the bomber weapon system survives. However, GWEN is designed to operate within limits, only as long as it survives physical destruction. The MEECN system is designed to provide assured strategic communications in all phases of a conflict. GWEN has been designed to provide assured strategic communications in an electromagnetic pulse (EMP) stressed environment. Through periodic testing and proper maintenance, the GWEN system will be in a high state of readiness during the pre-attack period. Operations after an attack are not assured because the system is not designed to survive physical attack. Thus, GWEN is not meant to fight a prolonged nuclear war, but rather to strengthen our ability to prevent a nuclear war. Its very presence and ability to provide assured communications will deny the Soviet planners the option of a preemptive nuclear strike and as such, GWEN is a deterrent to nuclear war. However, GWEN will be used for strategic communications as long as it survives physical destruction.

## THREAT REASSESSMENT

Mr. **Chappell**. Let me turn to the requirements as related to the threat.

Several studies of GWEN relay station requirements have produced different results based on different threat assessments to GWEN. As a result of a recent threat reassessment, DoD has reduced the number of GWEN relay stations from 236 to 127.

The Air Force study in part lowers the relay station requirement because it ———.

What new information or revised assumptions did the Air Force use to reduce the ———?

Colonel **Foster**. Sir, the Intelligence Community did evaluate the threat and the ———, and when they looked at the sites, it was decided that we did not need that many, did not need 240 or 236.

We looked at exactly how many would be needed to give us the required capability for at least two stations to hear all of our input/output nodes and all fixed receiver nodes, about 130 or 127 would be the adequate number.

The threat was re-evaluated by all of the Intelligence Community.

Mr. **Chappell**. The Air Force's threat assessment notes that the Soviets are developing two long-range, land attack cruise missiles, one of which is expected to become operational in 1986. Only one of the prior four studies on GWEN cited a cruise missile threat.

Assuming that cruise missiles provide a shorter warning time than SLBMs, do they pose a greater threat to key coastal relay stations than SLBMs?

Colonel **Foster**. Sir, ———, but the GWEN system is structured so that as the threat increases or decreases, you can add more GWEN stations. And to keep a robust system, you can do that.

The GWEN system has 127 nodes throughout the country; they are specifically within certain distances so you can keep communications. If you lose one site——

Mr. **Chappell**. That is to increase the survivability?

Colonel **Foster**. Increase the survivability, some, yes, and we figure how many we actually need to keep connectivity and how many to maintain survivability also.

Mr. **Chappell**. So you are saying the ———, but the way you pattern it, you get survivability by having enough of them, right?

Colonel **Foster**. Yes, sir.

Mr. **Chappell**. In its new 127 relay station configuration, is the GWEN system survivable against both SLBMs and cruise missiles?

Colonel **Foster**. It would not be survivable to a direct hit. The GWEN system is like a large AM radio tower. A blast effect of a weapon nearby would blow the tower down——

Mr. **Chappell**. But the answer to the last question would also fit the answer to this one? You are trying to have enough of them and dispersed so——

Colonel **Foster**. Yes.

Mr. **Chappell**. So you would have survivability even with a combined threat, is that correct?

Colonel **Foster**. No, sir, a weapon nearby one relay node would knock that down, but you would have others around.

Mr. **Chappell**. The system survives under your planning.

Colonel **Foster**. Yes, sir. The system would survive.

Mr. **Chappell**. As a result of the Air Force's threat assessment, ———. Why?

Colonel **Foster**. Sir, ———.

Mr. **Chappell**. ———. Why?

I suppose the same answer would be given that you just gave.

Colonel **Foster**. Yes, sir, the same thing. ———.

Mr. **Chappell**. What other new information or revised assumptions did the Air Force use to revise the jamming threat to GWEN?

Colonel **Foster**. It is in an evolving threat that the system can evolve. The beauty of the GWEN is that you can add relay nodes as the threat increases.

Mr. **Chappell**. Please answer the following questions for the record.

[Clerk's note.—Questions submitted by Mr. Chappell and the answers thereto follow:]

### EMERGENCY ACTION MESSAGE DISSEMINATION FUNCTION

*Question.* An Institute for Defense Analysis study ———. Please explain the "emergency action dissemination function."

Answer. The emergency action message (EAM) dissemination function is the means by which the ——— EAM dissemination is the process in which the EAMs are communicated. GWEN will provide this assured strategic communications capability in an electromagnetic stressed environment in a very timely fashion.

### ASSESSMENT OF THE INSTITUTE OF DEFENSE ANALYSIS

*Question.* Do you concur with this assessment of the Institute for Defense Analysis? If not, how many relay stations does the Air Force estimate are necessary to carry out the tactical warning and positive control launch order functions?

Answer. No. The Air Force analysis completed in Nov. 85 was a thorough and rigorous assessment of GWEN against the postulated threat in 1990 (which was coordinated with the Defense Intelligence Agency). The study showed that a 127 relay node network provides better than ——— connectivity for the tactical warning, attack assessment and emergency action message dissemination missions and better than ——— connectivity for the positive control launch mission. The National Command Authority requires these high degrees of confidence to adequately maintain command and control over the strategic weapons systems in a nuclear stressed environment.

[Clerk's note.—End of questions submitted by Mr. Chappell.]

### BUDGETING CONSTRAINTS

Mr. Chappell. Did budgeting constraints play a part in reducing the 127 or does the previous answer still hold regardless of the economic evaluation?

Colonel Foster. There was a study—budgeting was done after any survivability and availability studies. Funding it was not a constraint at that time. Later it was. We said it is a good idea because we needed the money to field the required system.

Mr. Chappell. That didn't change the numbers.

Colonel Foster. No. sir.

Mr. Chappell. The numbers were not changed based on budget restraints.

Colonel Foster. That is correct, sir.

Mr. Chappell. The IOC for GWEN Phase II, Thin Line Connectivity Capability (TLCC) is scheduled for April 1986. GWEN terminals are not scheduled for installation for bomber crews, air crews on alert, and airborne command posts till 1989, and for missile fields till 1988.

SAC officials have said that without these terminals GWEN may not be adequate to preclude the destruction of bombers and other critical aircraft on the ground by Soviet submarine-launched ballistic missiles.

Do you agree with that?

Colonel Foster. Sir, we will have terminals at the SAC wing command posts. They are receive-only terminals. We will have connectivity to the SAC bombers not right to bombers, but to the command post.

Mr. Chappell. Why wouldn't the terminal program receive the same emphasis as GWEN to ensure schedule capability?

Colonel Foster. Sir, we are spending money in the budget this year on terminals.

Mr. Chappell. The GAO in its September 1985 report on GWEN notes that the initial operation capability of GWEN will be severely limited without the terminals.

Doesn't the GAO have a point? Do you agree?

Colonel Foster. Yes.

Mr. Chappell. And you have intended to make—

Colonel Foster. We are compatible and we are working on EMP and hardening of the terminals.

Mr. Chappell. What about the Thin Line, will it be capable of performing any of the parts of the GWEN mission?

Colonel Foster. Yes, sir, the Thin Line connects the bomber bases and ICBM bases in a figure-eight from the Washington, D.C., area. It will not connect all our bases, but does a good job of ———.

[Additional information follows:]

The TLCC phase will link the command posts, sensor and warning sites with each other and with the bombers and tankers. The TLCC phase of GWEN will enable the NCA to command and control the strategic bombers and tankers and to pass warning data and assessment of the threat. The number of relay nodes will have to be expanded past the 56 in TLCC to a total of 127 in the Final Operational Capability (FOC) phase in order to achieve the required increased coverage to additional receive only terminals and input output terminals added in FOC and to provide the additional survivability and system availability required for FOC.

### SITE ACQUISITION

Mr. Chappell. Turning to site acquisition, according to Aviation Week and Space Technology (February 24, 1986), citizens of four states—Maine, Massachusetts, Wisconsin and Oregon—have objected vigorously to proposed GWEN site locations. A suit has been filed over the program in the Federal District Court in Boston.

Are you still having site acquisition trouble in these states?

Colonel Foster. Yes, sir, we are.

Mr. Chappell. What is the status?

Colonel Foster. They look upon the system as being a capability to fight a prolonged, protracted nuclear war.

The status is that the judge said this is a policy issue and is not to be determined in the courts and it is not an environmental issue. The suit was dismissed.

Mr. Chappell. It is a governmental policy issue for the Congress and the President, is that right?

Colonel Foster. Yes, sir.

Mr. Chappell. Have citizens of any other states joined in this vigorous level of protest against site acquisition in their states?

Colonel Foster. Sir, it is primarily Massachusetts, Maine and Oregon.

[Additional information provided:]

There has been no organized opposition to GWEN in other states. Where there have been questions objections, they were isolated cases concerning zoning, local land use laws, etc. and differences have been resolved through discussions with local officials citizens.

Mr. CHAPPELL. Can you provide for the record the location, proposed locations for the GWEN for which acquisition is being delayed because of these protesters?

Colonel FOSTER. Yes, sir, we can.

[The information follows:]

Acquisition of the following sites is being delayed because of opposition to GWEN: Eugene, OR; Barre Falls Amherst, MA; Castine, ME; and Sherman Mills, ME.

### STATUS OF THIN LINE

Mr. CHAPPELL. What is the overal status of the acquisition for Thin Line?

Colonel FOSTER. Thin Line is 56 relay sites and we are about nine or ten short of that right now. We expect to have them acquired or leased by this coming summer.

Mr. CHAPPELL. Has your IOC been affected by the protests?

Colonel FOSTER. Yes, I would say yes, IOC is affected by the protests in that we will not have some sites—our northern sites around Massachusetts and in Maine, we will not have those sites.

Mr. CHAPPELL. How much slippage have you got because of it?

Colonel FOSTER. We perceive no more than about five to six months.

Mr. CHAPPELL. Is the Air Force now actively acquiring land parceis to bring GWEN up to its full operational capability of 127 relay stations?

Colonel FOSTER. We are in the process of looking at leases. It is a long and tedious process. We go out and evaluate working with the local communities to assure them that we are good neighbors. However, we must complete operational test and evaluation of the TLCC prior to entering the FOC phase. We expect to begin site acquisition by September 1986.

We are in the process of doing that now.

Mr. CHAPPELL. Are you getting any protests so far on the relay stations?

Colonel FOSTER. We get some protests, yes, sir, primarily in Massachusetts.

Mr. CHAPPELL. Same areas?

Colonel FOSTER. Same ones, Massachusetts is where the No GWEN Alliance is headquartered.

Mr. CHAPPELL. I think you have actually answered 15, but if you haven't, you can do it for the record.

[The information follows:]

Objections to GWEN towers generally fall into two categories: National Defense policy objections and environmental objections. National Defense policy objections arise from an overall anti-nuclear policy position on the part of the protestors. These issues have been difficult to deal with as they pertain to U.S. nuclear policies that are better addressed by Congress or the President. The Air Force generally has not address these objections directly. Another policy objection stems from a misperception that GWEN is intended to fight a prolonged nuclear war. Air Force responses to these objections concentrate on the fact the GWEN is intended to deter a nuclear war by assuring communications between National Command Authorities and our strategic forces. GWEN is designed to assure dissemination of TW/AA.

force management, emergency action messages and positive control launch of our bomber and tanker forces in the first moments of a nuclear war. GWEN is not intended to survive direct nuclear attack, but rather to assure communications in the electromagnetic pulse (EMP) environment associated with a high altitude burst. Because of the layout of the GWEN network, parts of it may survive for use in the trans- and post-attack phase, but this was and is not a primary design consideration. Concerns over environmental issues have primarily focused on aesthetics and effects of low frequency radio energy. The tower is purposely gray with only one strobe light to minimize visual impact. The Air Force has provided considerable information to show that GWEN generally has no environmental impacts. GWEN is very much like a standard AM broadcast tower with considerably lower frequency (150-175 KHz vs. 530-1610 KHz) and lower power (2000 watts vs 10,000-50,000 watts).

Mr. CHAPPELL. Please answer the rest of the questions for the record.

[CLERK'S NOTE.—Questions submitted by Mr. Chappell and the answers thereto follow:]

### REQUIREMENTS AS RELATED TO THE THREAT

*Question.* Several studies of GWEN relay station requirements have produced different results based on different threat assessments to GWEN. As a result of a recent threat reassessment, DoD has reduced the number of GWEN relay stations from 236 to 127. The Air Force study in part lowers the relay station requirement because ———. What new information or revised assumptions did the Air Force use to ——— to GWEN compared to earlier assessments?

Answer. The threat used in the AF analysis of October 1985 used 1990 and 1995 force projection figures from National Intelligence Estimate 11-3/8-84-85. The threat was coordinated with the Defense Intelligence Agency (DIA). The threat stated that ———. Due to these uncertainties and the fact that the threat had evolved over the three years since the assessment had been made, a new assessment was performed and the threat revised to reflect current targeting estimates for SLBM's against GWEN. ———. GWEN provided excellent message connectivity under this realistic threat.

*Question.* The Air Force's threat reassessment notes that the Soviets are ———. Assuming that cruise missiles provide a shorter warning time than SLBMs, do they pose a greater threat to key coastal relay stations than SLBMs?

Answer. ——— For any weapon to pose a significant threat to GWEN it must be capable of surgically severing the network prior to a message propagating through the network. This severing action, called a cutset attack, must kill several contiguous nodes deep in the network to stop message propagation. The Air Force study identified a minimum of ———.

*Question.* Do cruise missiles threaten GWEN survivability?

Answer. As discussed above. ———.

*Question.* In its new 127 relay station configuration is the GWEN system survivable against both SLBMs and cruise missiles?

Answer. The 127 node GWEN configuration ———.

*Question.* Did DoD add any GWEN relay stations to increase survivability against cruise missile attack? If not, why not?

Answer. The Air Force study ———.

[CLERK'S NOTE.—End of questions submitted by Mr. Chappell.]

## RELAY STATION'S SELECTION

Mr. **Chappell**. What are the factors that go into the relay station's selection?

Colonel **Foster**. What we need is level land and good connectivity because it is low frequency. We need commercial power. We need telephone lines, and we need a road nearby, but that is about all.

If you drove by it and looked at it, you would see it as a standard AM radio tower. In fact, it is very low power, also.

Mr. **Chappell**. If you had a problem in one location, you could conceivably move to some other location, whether a protest or not?

Colonel **Foster**. No, we have a problem there, sir, in that we have to make connectivity and to have the connectivity, we need it in certain locations from tower to tower. Distance wise, they have to be in certain locations.

Mr. **Chappell**. So the planned location, the plan sites are vital.

Colonel **Foster**. Yes, sir, within certain bounds. We look at each GWEN site and we go into the area where we need the GWEN site and we evaluate it, and we have to find someone to lease or sell land and we have to find the right soil, et cetera.

Mr. **Chappell**. Newsweek reports that one site for GWEN in Klamath Falls, Oregon, was relocated because it affected one of the largest nesting grounds in the United States for the Bald Eagle. Did this relocation have an adverse impact on operation of the program?

Colonel **Foster**. It had an impact, sir. I don't know how adverse yet, but we are still evaluating.

We have not made the connectivity on the west coast from Washington on down to northern California. We are looking at that right now, and that is one of the several we still have to settle before we get the Thin Line connectivity.

Mr. **Chappell**. Are there any health and safety hazards connected with the location of the sites?

Colonel **Foster**. None at all as far as we know, sir. It is just like being next to an AM radio station, which we see all over the place. In fact, it is much lower power.

[Additional information provided:]

Selected sites must meet several inclusionary requirements:

A. Twelve acres (700' × 700') of cleared, relatively flat land;
b. In close proximity to a paved access road;
c. In close proximity to three-phase power; and
d. Landowners willing to sell or lease for a minimum of fifteen years.

Exclusionary factors are:

a. Significant environmental impact;
b. Site in flood plain;
c. Site requires excessive clearing/grading;
d. Rocky soil (making laying of copper grid difficult); and
e. Site requires long, costly power runs and/or access roads (limited by Federal law to a maximum of $100,000 per site for upgrades).
f. FAA Hazards: airports, etc.

The Thin Line portion of the system provides initial connectivity. Geographic areas for relay station sites are computer generated and provide "footprints" with a 9 mile radius in which a site will provide optimum connectivity to neighboring sites. The placement of the 56 Thin Lines sites is a direct result of this computer enhanced approach. Moving some relay stations beyond the footprint may actually require more sites be added to assure Thin Line connectivity.

The move from Klamath Falls will cost time and money. However, the US Fish and Wildlife Service did not feel that the potential impact to the American bald eagle could be mitigated without moving and as such constituted a legitimate concern. The site was over a mile from the nesting area, but was within a mile of potential feeding areas. Nevertheless, a site in the Klamath Falls area is vital for system connectivity along the coast. We are presently evaluating new sites in this area.

### ENVIRONMENTAL IMPACT STATEMENT

Mr. **Chappell**. Does the Air Force file an environmental impact statement?

Colonel **Foster**. We file an Environmental Assessment for every station, yes.

Mr. **Chappell**. So as you progress, you have to continue to file them?

Colonel **Foster**. An assessment in each place. It is called an Environmental Assessment that we have been filing.

[Additional information provided:]

The Air Force completed a generic environmental assessment of the GWEN system before commencing the deployment of the Thin Line Connectivity Capability phase. At each site, a site specific review of environmental impact is performed. At all but a few of the sites examined so far, there was clearly no impact to the environment and this conclusion is documented and coordinated with each state. Where there was any reasonable questions on the impact to the environment, an environmental assessment has been completed. The determination of whether to complete an environmental impact statement for the Final Operational Capability phase is being considered now. As a minimum, an environmental assessment will be completed. If a "statement" is warranted, the Air Force will announce its intent to prepare an environmental impact statement in the Federal Register, and accomplish the statement in an open and public manner.

Mr. **Chappell**. Okay. Does the doctrine of Federal supremacy to state and local laws in this matter prevail here?

Colonel **Foster**. It would, but we are trying not to do that at all. We want to be good neighbors; we want to go into where we don't make enemies. We try—

Mr. **Chappell**. You had to invoke the doctrine, what does that mean?

Colonel **Foster**. That means that the Federal Government is not subject to local land use laws. The Federal Government can go in and expropriate the land. If they have a law that says you can't have a tower higher than 200 feet, the Federal Government, if it needed, could go in with a 299-foot tower once we expropriate.

### TURNKEY METHOD

Mr. **Chappell**. Are you using the TURNKEY method of acquisition?

Colonel **Foster**. Absolutely.

Mr. **Chappell**. What does that mean?

Colonel **Foster**. The TURNKEY method is that we buy—we have a contractor and he supplies us with the entire system. We say, "Build us the GWEN terminal, the station," and we go in and everything is there and they give us the key to the door.

Mr. **Chappell**. Have you——

Colonel **Foster**. And we operate it.

## THIN LINE TESTING

Mr. Chappell. Have you tested the Thin Line?

Colonel Foster. The Thin Line we will start testing this summer. We have done tests in the Midwest in the last couple of years on the Initial Connectivity Capability phases. We will start probably in July or August for the testing, take about 60 days.

Mr. Chappell. Do you have requirements in the procurement requests that go beyond the Thin Line program?

Colonel Foster. Yes, sir, up to the 127 from 56. We need approximately 127 relay nodes.

Mr. Chappell. What tests do you have to go through to test whether it is satisfactory or not?

Colonel Foster. Whether we get a stafisfactory system?

Mr. Chappell. Yes.

Colonel Foster. It is a communications test, end to end, practice Emergency Action Messages, and to all bomber bases. It will be run by a test team.

Mr. Chappell. Should we go ahead with procurement before you finish the testing on the Thin Line?

Colonel Foster. Sir, we will be finishing the testing this summer, and we will be ready to go into the production phase in 1987.

Mr. Chappell. Please answer the following questions for the record.

[Clerk's note.—Questions submitted by Mr. Chappell and the answers thereto follow:]

## GWEN RESEARCH FUNDS

*Question.* Significant amounts for research are programmed through FY 1991 while procurement of the fully operational system is ongoing. Please explain the rationale for this funding plan.

Answer. The FY87 President's Budget RDT&E request for PE 33131F, Minimum Essential Emergency Communications Network (MEECN), funds GWEN and other projects. The GWEN funding line is about 38% of the total programmed in FY87-91. The GWEN portion of overall MEECN RDT&E funding is: FY87—$38.6M, FY88—$18.4M, FY89—$15.0M, FY90—$6.4M, and FY91—$1.1M. GWEN RDT&E funds will continue development of the portable receive only terminals in FY87. The development of the airborne input/output terminal and the missile Launch Control Center receive only terminal will continue through FY89. This funding plan allows the completion of a majority of the ground based system and then an expansion of the system to include airborne and other assets as equipment becomes available. To delay the entire program until all equipment is developed would cause an unacceptable and unnecessary delay in fielding this critical system. The equipment still under development is low risk and does not impose risk on the overall program.

*Question.* For the record please provide the unit cost of a receive station, a relay station, and an input/output station.

Answer. Unit cost (in base your FY86 $) of a receive station is $.557M; relay station is $1.56M; and input/output station is $2.23M.

## THREE PHASES OF GWEN

*Question.* For the record please provide for each of the three phases of GWEN: The procurement schedule for the receive stations, the relay stations, the input/output stations, and other major components, and the total cost of each phase.

Answer. The procurement schedule and total cost of each phase for the receive only terminals (ROs), relay nodes (RNs), and input/output terminals (I/Os) is:

| | |
|---|---|
| Phase I—Initial Connectivity Capability (ICC) Phase: | |
| 9 Fixed RNs | |
| 11 Fixed ROs | |
| 3 Fixed I/OS | |
| Initial Operational Capability (IOC) | Apr. 1984 |
| Total Cost of Phase I | $22.7 |
| Phase II—Thin Line Connectivity Capability (TLCC), will be completed in two parts, IIA and IIB: | |
| Phase IIA: | |
| 56 Fixed RNs | |
| 30 Fixed ROs | |
| 8 Fixed I/Os | |
| IOC | Sept. 1986 |
| Phase IIB—Development Completion of: | |
| Portable ROs | July 1987 |
| Launch Control Center ROs | Jan. 1988 |
| Airborne I/Os | Apr. 1989 |
| Total Cost of TLCC Phase II | $247.9 |
| Phase III—Final Operational Capability (FOC): | |
| 71 Fixed RNS | Sept. 1989 |
| 4 Fixed I/Os | Sept. 1989 |
| 30 Portable ROs | Sept. 1989 |
| 105 Missile Launch Control Center ROs | Sept. 1990 |
| 9 Airborne ROs | Sept. 1991 |
| 23 Airborne I/Os | Sept. 1992 |
| Total Cost of Phase III | $462.5 |
| Total System Acquisition Cost [1] | $733.1 |

[1] Does not include operation and maintenance costs.

Note: Dollars in millions.

## COMPLETION OF GWEN PROGRAM

*Question.* For the record when will the entire GWEN program, including the relay stations, terminals and other equipment be completed and fully operational?

Answer. GWEN will be fully operational by the end of FY92.

*Question.* What is the revised total cost of the program?

Answer. The total acquisition cost of the program to completion in FY92 is approximately $733.1M.

*Question.* How much was saved by reducing the number of relay stations from 236 to 127?

Answer. At an average cost of $1.56M per relay node, the reduction from 236 to 127 will mean a savings of approximately $170M in FY86 dollars.

*Question.* Have program stretchouts added to program costs? If so, by how much?

Answer. Yes, program stretchouts have added to the overall cost of the program, but these costs cannot be readily quantified. The program schedule has stretched about one year due to funding cuts and delays in awarding contracts. At a minimum, the cost of inflation on the last year of the program would be one portion of the increase. However, this is difficult to develop since the total program costs are just being firmed up as the program matures from development into production and deployment.

*Question.* What are the revised milestones for this program?

Answer. The revised program of 127 relay nodes has these milestones:

| | |
|---|---|
| TLCC Initial Operational Capability | Sept. 1986 |
| 127 Relay Nodes Deployed | FY89 |
| Fixed Input/Output Terminals (I/Os) | FY89 |
| Portable and Fixed Receive Only Terminals (ROs) | FY89 |
| Launch Control Center ROs | FY91 |
| Airborne I/Os | FY92 |
| Full Operational Capability | FY92 |

[CLERK'S NOTE.—End of questions submitted by Mr. Chappell.]

### OVER THE HORIZON BACKSCATTER

Mr. CHAPPELL. Mr. McDade.

Mr. McDADE. Thank you, Mr. Chairman.

I want to talk about the over-the Horizon Backscatter Radar which I think we agreed was intended to provide early warning of bomber and cruise missile attacks on the continental United States.

Originally for bombers and larger vehicles, air vehicles, but now we are very much looking for cruise missiles and that has become the most of the work. When it was originally designed and developed, it was not for cruise missiles, but now we are trying to make it fit. That is sort of part of the problem.

Colonel FOSTER. We are testing this coming summer. We have tested against very small vehicles in the past. This past year, we have done very well—looks like a pretty good job so far.

Mr. McDADE. The DIA in July 1985 assessed the ———. I don't think we would disagree with that. Would you?

Colonel FOSTER. Probably, no.

Mr. McDADE. That is the threat assessment as of today?

Colonel FOSTER. Yes, sir.

Mr. McDADE. If that is the case and we get an assault the way DIA thinks we would, ballistic missiles on U.S. targets, how effective would the OTH-B be after that event? Will it even exist?

Colonel FOSTER. It probably will not exist. We must be prepared for the Soviet Union to attack in any way and it could be they are building up their bomber forces; they are building up their air-launched cruise missiles. And they are building up their sea-launched cruise missiles. We can't predict that they would absolutely attack with ballistic missiles first.

Mr. McDADE. This system has never been tested against a cruise missile, isn't that right?

Colonel FOSTER. We have a test system.

Mr. McDADE. You have never had a full-up test, have you, of this system?

Colonel **Foster**. Not a full-up test against cruise missiles. This summer we test against drones simulating cruise missiles. ———.

We think we can do pretty well against cruise missiles. We have done very well against some small aircraft out in the West.

Mr. **McDade**. Let me tell you, Colonel, that we have projections of radar systems detection for cruise missiles and they range according to what we are told from ———.

The system also appears to have questionable detection capacity for bomber raids of fewer than ——— aircraft.

Do you agree with those statements, ———?

Colonel **Foster**. No, sir. I can't agree with those, because if ——— aircraft is considered———

Mr. **McDade**. I am talking about cruise missiles.

Colonel **Foster**. I think we can detect up to ———. I believe we are looking at about a ——— probability of detecting a raid. That is what we really want to do, be able to detect a raid that we know is coming. And for individual aircraft, I believe we are talking about a ——— percent probability of detection at any time.

Mr. **McDade**. But that is a question that is responsive to a question posed that ignores what the DIA says, i.e., ———?

Colonel **Foster**. Yes, sir, but our testing shows that ——

Mr. **McDade**. I have a series of very specific questions.

The committee is very concerned that maybe we are buying a bit of yesterday's technology and kind of stuck with it. We are concerned, too, that there is a concurrent purchase at the time you are doing R&D. We have not shown its effectiveness against a cruise missile in a full-up test, yet we are asked to fund two in this year's budget and we funded a lot of money previously, as you showed on the chart.

I want you to take the questions and respond to them for the record, if you would.

Mr. **McDade**. We need to hear from you as promptly as you can.

Colonel **Foster**. Sure.

Mr. **McDade**. With assurances this is not yesterday's technology or yesterday's threat, and what kind of additional warning this might give us if indeed the DIA is accurate and the threat assessment is accurate, and what we are looking at is a first strike or a strike with missiles followed perhaps by aircraft and cruise missiles.

Colonel **Foster**. Yes, sir, we can answer all those questions.

Mr. **McDade**. I am sure you can.

Thank you, Colonel.

Thank you, Mr. Chairman.

[Clerk' note.—Questions submitted by Mr. McDade and the answers thereto follow:]

### OTH–B THE THREAT

*Question*. The Over-the-Horizon Backscatter (OTH–B) Radar is intended to provide early warning of bomber and cruise missile attacks on North America. ———?

Answer. ———.

### OTH-B EFFECTIVENESS

*Question.* How effectively will the OTH-B complete its mission after a massive ballistic missile attack in which the OTH-B sites themselves would most likely be targets?

Answer. The mission of OTH-B is Tactical Warning of air-breathing attack. The OTH-B radar will not survive a nuclear strike on one of its components (transmitter, receiver, or operations center). The radar is expected to continue to operate until attacked.

*Question.* Projections of the OTH-B radar systems' detection probability for cruise missiles range from only ———. Is this an accurate assessment of the systems' capability? If not, please give the Committee an accurate assessment.

Answer. No, it is not an accurate assessment of the system's capability. The probability of the radar detecting air vehicles is affected by ionospheric conditions. The worst ionospheric conditions occur in the northern sector of the East Coast Radar System which is why the Experimental Radar System (ERS) covered that area. Tests with the ERS over 15 months demonstrated probabilities of detecting a ———.

*Question.* The Soviets are capable of employing a small number of ———. How effective will the OTH-B radar system be against such a precursor attack?

Answer. The OTH-B radar system will detect the air launched cruise missile (ALCM) carriers penetrating its coverage at all times. Current data indicates the radar will ———.

*Question.* How effective will the OTH-B radar system be against a Soviet attack that employs stealth technology in their missiles and bombers?

Answer. The OTH-B radar has ———.

### OTH-B TESTING

*Question.* Since the OTH-B radar was developed, the estimate of the threat has changed from bombers and large air-to-surface missiles of the 1970's to include newer, smaller air and sea launched cruise missiles. Test results of the OTH-B reported by the Air Force in response to the Committee's Report that OTH capability in the 5-9 MHz region were not conducted because of a limited facility. "Unfortunately, the night ionosphere forces the radar to use frequencies in the 5 to 15 MHz band." Is it accurate to say that as yet there are no definitive test results that demonstrate the OTH-B radar system. ———. Is it accurate to say that the FY 1986 and FY 1987 tests using the initial sector of the East Coast Radar System will be the first operational test of whether the OTH-B can detect a ———?

Answer. There is no test data available demonstrating detection of a ———.

### ALTERNATIVES

*Question.* The Air Force has just finished modernizing the Alaskan Air Defense System through the Seek Igloo program and the procurement of a Regional Operational Control Center for Alaska. Why do we now need the two sectors of the OTH-B in Alaska?

Answer. SEEK IGLOO was approved and implemented based on Operations and Maintenance (O&M) cost savings and not on an increased operational capability. A secondary benefit was that the existing 30 year old system, which was becoming difficult to maintain, was modernized with a one-for-one radar replacement—but its radar coverage remained the same. SEEK IGLOO was limited to the Alaskan mainland. The Alaskan OTH-B Radar System is required for air surveillance over the Aleutian Islands. The only existing capability is a single microwave radar at Cold Bay, which provides ———.

*Question*. The FY 1987 budget requests $188.2 million for procurement of two West Coast Sectors. Why shouldn't the procurement of additional sectors be deferred until after the first operational tests of an OTH-B sector for ———?

Answer. Experimental Radar System (ERS) was developed and tested in 1980 and 1981. These tests proved that an OTH-B could detect bombers and air-to-surface missiles, ———.

Given the above data, buying the last two sectors of the West Coast Radar System in FY 1987 is a prudent expenditure. Breaking the production line in FY 1987 will increase the cost to acquire the sectors due to production line start-up costs.

*Question*. Please describe the capabilities of ———. How significant is the OTH-B's 1800 mile range in the light of the warning provided by ——— and the low likelihood that the Soviets would initiate a nuclear conflict with a long-range bomber attack?

Answer. There are a variety of ———.

The Over-the-Horizon Backscatter (OTH-B) radar provides tactical warning that the attack is in progress and supports an assessment of the likely targets and raid size. The tactical warning must be given while the attacking vehicles are sufficiently far from their targets to allow time for the National Command Authority to make decisions and disseminate them to the forces and for survival actions by the retaliatory forces. OTH-B provides this time through surveilling out to 1800 miles. The OTH-B radar also provides real-time track data to the forces charged with limiting the damage from the atmospheric attack.

Thus ——— and sensors like the OTH-B complement each other and both are required to deter an air-breathing attack on North America.

*Question*. If the Joint Surveillance System Federal Aviation Administration Air Force Radar Replacement JSS-FARR program were modified to include ECCM and a siting plan that provided warning for low-altitude attack, could JSS-FARR be a cost-effective alternative to OTH-B? Would it be a cost-effective alternative to the central continental U.S. and possibly the Alaskan sectors?

Answer. Microwave radars, such as those in FARR program, are limited against low altitude targets by the radar horizon. To form a surveillance barrier around the US, the radars would need to be located, on average, every 50 miles along the coast and US/Mexico border. Canada would need to locate radars along their coasts linking to the North Warning System (NWS) or the US would need to locate radars along the US/Canada border. The cost to acquire, operate, and support the hundreds of radars required greatly exceeds the cost of the OTH-B.

The military utility of the microwave radar surveillance barrier, without OTH-B, would be much less than that of a joint barrier. The microwave radars could not detect hostile aircraft or cruise missile flying at less than 1,000 ft altitude until these vehicles were within line of sight, about 50 miles of the radar. This puts the vehicle within ———. It should be noted that the JSS-FARR radar system and the OTH-B radar system complement each other, and both are militarily useful radar systems for their respective missions. OTH-B provides tactical warning and the JSS-FARR radar system supports the airspace sovereignty/air defense mission. The JSS-FARR radar system also supports the Federal Aviation Administration airspace management and safety-of-flight missions.

*Question.* OTH-B limitations may be predictable by the Soviets and merely complicate rather than deter a precursor attack. Wouldn't random AWACS flights in the areas not covered by initial east and west coast OTH-B sectors make surprise attack sufficiently risky to provide deterrence?

Answer. OTH-B limitations may be predictable by the Soviets in a statistical sense. That is, they may predict the OTH-B has an ———. They can't predict in advance how well the OTH-B will perform on December 14th. The AWACS assets are limited in number and have a world-wide mission. If round-the-clock random patrols were planned in the areas not covered by the initial east and west coast OTH-B sectors, more aircraft would be needed. The Air Force has judged this solution to be non-cost effective.

*Question.* Would the money for OTH-B be better spent advancing space-based radar, rather than on constructing a costly interim system of questionable effectiveness? Teal Ruby is an experimental satellite that is expected to see the same atmospheric targets as the OTH-B. Would our money be better placed accelerating the Teal Ruby program?

Answer. Much technology work remains before the Air Force could commit to a space-based radar that would detect ———. The earliest that a full scale development program could be started is the mid-1990s leading to a test satellite by 2000. The operational constellation would not be available before 2005. Teal Ruby is only a technology experiment. Results of the experiment will not be known until 24 months after the late 1986 launch (now in question due to STS status). Moreover, Teal Ruby is an infrared sensor that can be obscured by clouds, limiting its detection capabilities. The cruise missile threat exists today and continues to grow. To counter that threat we need a deployed, operational warning system now. OTH-B will provide warning of an atomspheric attack on North America. Tests with OTH-B type radars have shown the capability to detect ———.

## OTH-B BUDGET

*Question.* Please place in the record the total estimated cost of the OTH-B program by appropriation account. Also indicate the total cost through FY 1986 and the funding schedule by fiscal year and appropriation account for the remainder of the program. Include the schedule for procurement of each of the remaining sectors.

Answer. The OTH-B radar program total system acquisition cost is:

| *Account* | *Millions* |
|---|---|
| RDT&E | $463.6 |
| Other procurement | 1,888.4 |
| Military construction | 232.6 |
| Total | 2,584.6 |

The cost and sector acquisition schedule is ($ in millions):

| Account | FY 1986 and prior | FY 1987 | FY 1988 | FY 1989 | FY 1990 | FY 1991 | To complete |
|---|---|---|---|---|---|---|---|
| RDT&E | 317.4 | 33.9 | 46.5 | 14.7 | 20.8 | 14.3 | 16.0 |
| Other procurement | 418.7 | 200.1 | 283.4 | 174.1 | 190.0 | 210.9 | 411.2 |
| Military construction | 20.3 | 26.1 | 102.6 | 23.6 | 24.3 | 20.6 | 15.1 |
| Sector schedule | 3 East<br>1 West | 1 West | 2 Cen | 1 A | 1 A | 1 Cen | 1 Cen |

[CLERK'S NOTE.—End of questions submitted by Mr. McDade.]

Mr. CHAPPELL. We will put the rest of the questions in the record, Colonel. I know you hate to hear that, but we will do that.

[CLERK'S NOTE.—Questions submitted for the record and the answers thereto follow:]

### DEFENSE SUPPORT PROGRAM

*Question.* The Defense Support Program (DSP) ———. The FY 1987 budget proposes a multi-year program for the Defense Support Program (DSP), which will increase the constellation size by one and add one back-up spare on the ground. The Committee understands that no approved requirements document supports the FY 1987 budget proposed change in the size of the constellation. When is that document expected to be approved? What other constellation configurations have been considered, and what is your assessment of those constellations? What consideration was given to using ——— to perform the function of this additional on-orbit satellite?

Answer. The Defense Support Program (DSP) System Operational Concept (SOC) was approved by HQ USAF on April 2, 1986. The SOC is currently at AF Space Command for publication and distribution by the middle of May. The SOC defines the required constellation as ——— one on-orbit spare, and one spare on the ground ready for launch within launch vehicle leadtime.

No other constellation configurations were considered as the current DSP satellites are designed only for synchronous orbit.

DSP-Augmentation (DSP-A) is ———.

*Question.* Stability of Design is one of the criteria that the law established for approval of candidates for multi-year procurement. The satellite design which is the base configuration for the FY 1987 request has yet to be proven on-orbit. What are the highest risk features of the system design? What is your assessment of these features on the design stability of the program?

Answer. The highest risk feature of the DSP-I design is the laser crosslink. All other design changes are relatively low risk. The

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laser crosslink has gone through extensive tests and has shown that it meets the basic design requirements. It is possible that on-orbit performance might require some changes but the basic design was made with very conservative estimates of performance so any changes to the crosslink should by minimal. In addition, the laser crosslink is a small subsystem (less than 7% of the satellite's weight and power) so no changes in overall satellite design are expected.

*Question.* An overall space plan, the Strategic Defense Architecture 2000, will not be produced until after FY 1987. This plan identifies DoD's space strategy. Is this plan likely to contribute to the design instability of the DSP program?

Answer. SDA 2000 will not perturb DSP design stability. SDA 2000 places emphasis on increased endurability and capability to deal with emerging threats. DSP will be capable of supporting this direction based on the upgrades being developed in the new generation DSP-I satellite and the survivable Mobile Ground System.

*Question.* The preliminary test report on flight 12, which utilizes some new technologies, will not be released until August 1986. How is this report likely to affect design stability of the DSP?

Answer. The test report on flight 12, the first satellite to incorporate the new Sensor Evolutionary Development (SED) sensor, should have no impact on the basic design of succeeding satellites. All future DSP satellites are incorporating the SED sensor.

After the launch of any satellite, all problems are documented for possible correction on subsequent satellite. We will continue to adhere to this policy, and that may result in some changes to these new technologies as well as existing systems, but this does not portend any basic instabilities.

*Question.* The advertised savings for the multiyear procurement approach for the DSP is $350 million. Are the risks of design instabilities of a multiyear approach acceptable when measured against the benefit of a possible $450 million savings?

Answer. The cost savings of a multiyear over an annual buy approach are documented at $329 million. These savings have been developed through extensive discussions and negotiations with the contractor team that will produce the satellites under fixed price type contracts. The satellites, numbers 18–22, will be copies of satellite 17 and the risk of any design instabilities is absolutely minimal.

*Question.* The Committee understands that the DoD is proposing an accelerated DSP launch schedule beginning in the late 1980's to replace aging satellites as well as to add an additional on-orbit satellite. Can the launch schedule still be maintained in view of the space shuttle accident? Are there sufficient ground support equipment and personnel to ensure operation of an increased satellite constellation?

Answer. ———. DSP is duel compatible with the shuttle and CELV thus the future schedule will be minimally affected by launch vehicle problems.———. The on-orbit spare will be maintained in a healthy stand-by status within the current ground system. No additional ground systems or personnel will be required.

## MOBILE GROUND STATIONS

*Question.* Completed Mobile Ground Stations will significantly improve the survivability of the total system. How does the planned fielding of the Mobile Ground Stations fit into the accelerated DSP launch schedule?

Answer. The Mobile Ground System (MGS) is completely independent of the DSP launch schedule. Currently, all six MGSs have been delivered with no more being procured. They have just comleted their initial operational tests ———.

## SENSOR EVOLUTIONARY DEVELOPMENT (SED)

*Question.* ——— the Air Force launched a DSP satellite with an upgraded sensor developed under the Sensor Evolutionary Development (SED) program. System 1 software is being developed to take full advantage of the SED feature of this satellite. How will System 1 improve capabilities over the current software? Is it advisable to pursue System 1 development while other system ——— are not being fully addressed?

Answer. System 1 will take advantage of the greater resolution provided by the Sensor Evolutionary Development Satellites, and will provide much more. System 1 will be a major software redesign and rearchitecture including the improved features of both SED and DSP-1. Our plans are to take the assembly language software and change the design to use the higher order language, Ada. This new top-level design will allow greater flexibility in enhancing data processing and reducing system noise. It will facilitate the processing of data from several DSP satellites, and the consolidation of data from other national resources. It will provide greater flexibility in thresholding data (to reject noise). The system will also be more tolerant of problems in both the data processing and in the satellite. Finally, the man-machine (display) interface will be improved to take advantage of new hardware (already on contract and partially installed). In short, System 1 will be a major improvement to DSP software.

System ——— are being addressed in the DSP-1 effort. System 1 is the software portion of the SED and DSP-1 upgrades, allowing full use of the new features ———. System 1 has been scheduled somewhat behind the hardware upgrades in order to operate and fully understand key features before implementing the software to take full advantage of those features.

*Question.* Development of System 1 is not expected to be completed till 1990. Why has the System 1 development effort been delayed? How meaningful are the flight 12 test results—given the fact that it utilizes the new SED hardware but is still supported by existing software?

Answer. Completion of System 1 has been delayed from August 1989 to April 1990 due to protracted contract negotiations and funding constraints. Test results from flight 12 (the first SED satellite) will be meaningful even though it is supported by existing software (System 7). These results will be fed into the software package (System 8I) being developed to allow initial operation of the new generation DSP-I satellites which continue to incorporate the SED sensor. Although System 1 represents a revised architecture of the DSP ground station software, using higher order programming language (Ada) and making future maintenance and modifications much less expensive, it will also provide for the full use of the new capabilites of DSP-I. The results from flights 12, 13 and 14 will each provide inputs to System 1 development.

*Question.* Does the Air Force have a master plan that outlines both hardware and software development for the future? If not, when will one be completed?

Answer. The recently approved DSP System Operational Concept (SOC) outlines both future hardware and software developments. AF Space Command will publish the DSP SOC by the middle of May.

*Question.* Why does the Air Force plan to go sole source with IBM on System 1 development? Will this software develöpoment program give IBM advantages later on during the hardware procurement?

Answer. The Air Force plans to go sole source with IBM becaue of their 14 years of experience in developing the preceding 8 generations of SDP ground station software. They have in-plant facilities modeled after the DSP ground stations and the experienced manpower to do the job. Furthermore, System 1 will use significant portions of System 8I, currently being developed by IBM; therefore, using IBM to develop System 1 will greatly reduce the technical risk.

Although this effort hasn't been formally advertised, it was briefed at the February 1985 Southern California Professional Representative meeting and follow up inquiries were received from IBM, GTE, GE, Hughes and Litton-Mellonix. Letters were sent to these five and IBM and GTE responded positively, the others negatively. GTE's interest was conditional on being able to team with a DSP experienced contractor and being awarded three additional study tasks in the contract to help them gain the required level of experience. GTE has been unable to secure the necessary teaming arrangements and were officially notified that they are not considered a viable competitor. There is no follow-on hardware procurement associated with this effort, therefore IBM will not be receiving any undue advantage. This software will be installed in existing hardware recently upgraded by Aerojet Electro Systems Co.

[Clerk's note.—Classified questions and answers removed.]

### PLANNED IMPROVEMENTS TO DSP

*Question.* Will the planned improvements to DSP during the next few years be sufficient to overcome existing deficiencies? ———. How will that be addressed?

Answer. The evolving improvements to DSP will address limitations and deficiencies through the end of this century. The Sensor Evolutionary Development satellites, starting with Flight 12, will have Above-the-Horizon (ATH) sensors ———. The Mobile Ground System and DSP-I satellites, beginning with Flight 14, with their laser crosslink, mission data message broadcast, fuel sensor band and increased autonomy, will overcome survivability deficiencies. ———.

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## MOBILE GROUND SYSTEM OF THE DEFENSE SUPPORT PROGRAM

*Question.* The Defense Support Program (DSP). ——— for receiving, processing and disseminating data. The FY 1987 budget requests funds for procurement of a Mobile Ground System for the DSP, involving a number of 18 wheel tractor-trailers. Would you please describe the purpose of this Mobile Ground System, and tell us how it would work.

Answer. The Mobile Ground System (MGS) will provide the very survivable, ground processing element of the DSP System. Survivability will be assured through mobility, proliferation and autonomous operations. The MGS will back up fixed processing facilities during the pre-attack period and be the surviving DSP processing station during the trans- and post-attack periods. Each MGS will consist of a Mobile Ground Terminal (MGT) and a Mobile Communications Terminal (MCT), both of which will be capable of self-supported, deployed operations ———. Deployment time will be extended through the additional support provided by the Ground Support System and its maintenance, security, tanker, and crew support vehicles.

*Question.* The Mobile Ground System will include six independently capable mobile terminals. When the six mobile ground terminals are deployed and fully operational, what requirement is there for continuing the operation of the permanent ground station? What logistical requirements have been identified for the peacetime and wartime operations of the Mobile Ground System?

Answer. While the Mobile Ground System can do the basic DSP mission, it is not a replacement for a large fixed processing station. The MGS is a limited, austere system without the extensive commanding, troubleshooting, and housekeeping capabilities of the fixed stations. Therefore, we intend to continue using the fixed stations for the day-to-day peacetime role.

The logistical requirements for the MGS have been identified for peacetime and wartime operations and include the facilities and personnel to maintain the system at all times. These facilities include crew support vehicles, maintenace vehicles and fuel trucks to supply the system in the field. Intermediate maintenance will be accomplished at the main operating base and depot level maintenance is provided by Air Force Logistics Command through its Air Logistics Center in Sacramento, CA.

*Question.* Are there any plans to provide mobile ground stations for the other permanent ground stations in the Defense Support Program? If not, why not?

Answer. The six Mobile Ground Systems (MGS) are required to support the present constellation of three satellites in the trans and post attack periods. The MGS is not designed to replace fixed ground stations in peacetime, therefore, no plans have been made for an MGS to replace any permanent station.

## UPGRADE DATA COMPONENTS

*Question.* The Committee understands that the Air Force plan to upgrade the six data receiving and processing components for about $150 million and the six communications components for about $40-$50 million had been delayed until the Initial Operational Test and Evaluation (IOT&E) for each of the components is completed. What were the results of the IOT&E on each component of the Mobile Ground System? Please provide for the record the revised obligation schedules for each component of the Mobile Ground System for FY 1986 and FY 1987 stemming from the schedule and the results of the IOT&E.

Answer. Both major components of the Mobile Ground System, the Mobile Ground Terminal (MGT) and the Limited Communications Vehicle (LCV), passed the IOT&E with marginal ratings. (The LCV is the initial phase of the Mobile Communications Terminal ———. Although the overall rating was marginal, the system met or exceeded all user requirements in the essential areas of ——— operational availability and reliability.

The overall rating was marginal because of shortcomings such as inadequate spares support, immature software, marginal deployment schemes, and survivability limitations. The spares support and software immaturity are being corrected through total implementation of the logistical support and software maintenance systems. The operational deployment procedures are being studied for adjustments to correct the deployment inadequacies. And the survivability issues were already being addressed in the upgrades to make the Mobile Ground System compatible with the more survivable DSP-I satellites.

The revised FY 1986 and FY 1987 obligation schedules for the Mobile Ground System are as follows:

[In millions of dollars]

| | FY 1986 | | FY 1987 | |
|---|---|---|---|---|
| | 3d quarter | 4th quarter | 1st quarter | 2d quarter |
| MGT corrections | | | $8.9 | |
| MGT upgrade | $6.2 | $45.4 | 59.8 | $19.6 |
| LCV upgrade | | | | 15.8 |
| Total | 6.2 | 45.4 | 68.7 | 35.4 |

### SPACE CONTROL NETWORK

*Question*. The Data Systems Modernization (DSM) program is intended to replace the current computation system which currently commands and controls United States satellites at the Satellite Control Facility (SCF). Estimates of DSM costs from $190 million in the early 1980's to about $400 million currently, in large part because certain software requirements apparently were not defined early in the DSM program. What difficulties in defining user requirements did you encounter in this program?

Answer. In 1980, the DSM program was baselined to the best prediction of workload and satellite complexity expected at the time DSM would reach full operational capability. As the program progressed, it was determined that workload requirements were underestimated. This required upgrade of computer capacity and addition of peripheral equipment to support satellite monitor and control during peak conditions. Peak conditions occur during early orbit operations in combination with malfunctioning satellites and day to day support requirements. Furthermore, new satellite programs and block changes in older satellite designs, unforeseen in 1980, had to be incorporated in the DSM software. Firm definition of requirements for DSM was difficult, due to the evolving nature of space missions and complexity of the data systems being replaced.

In 1983, the DSM program was rebaselined to recognize requirements growth resulting from satellite program requirements and a more complete understanding of 1986–1990 satellite flight requirements. Since then, the baseline has not changed.

*Question.* According to the FY 1987 budget back-up books, 96 percent of the new software is complete. When does that mean DSM software at DSM mission control centers will be fully operational?

Answer. The DSM program has installed hardware and software in the first two satellite mission control complexes (MCCs) and has successfully demonstrated initial operational capability of the first MCC. Satellite programs will transition to the new DSM MCCs on a sequential basis to allow facilities modification of old pre-DSM MCCs which are no longer required. Full operational capability of all DSM MCCs in the Satellite Test Center, Sunnyvale AFS, CA, is on schedule for September 1987.

*Question.* Will the DSM program provide hardware and software for the Consolidated Space Operations Center (CSOC) in time to meet CSOC's original initial operational capability schedule? If DSM hardware and software will not be available to the CSOC on time, how will the delay affect classified Shuttle launches? What other impact could such a delay have on mission capabilities of the CSOC?

Answer. DSM should be available to meet CSOC's currently scheduled initial operational capability. The Data System Modernization (DSM) project, a development of the Air Force Satellite Control Facility (AFSCF), upgrades hardware and software employed in the control and monitoring of DOD satellites. CSOC funds an option to the DSM contract to acquire AFSCF-like DSM equipment for the two satellite Mission Control Complexes (MCCs) of CSOC's Satellite Operations Complex (SOC). Reallocation of CSOC funds, internal to the Air Force, delayed the initial operational capability dates of SOC's MCCs from FY 85 to FY 87. DSM equipment installed in the first MCC at the AFSCF's Satellite Test Center (STC), Sunnyvale AFS, CA has achieved initial operational capability. Full operational capability of DSM at the STC is scheduled for Sep 87. Therefore, DSM availability should not delay the currently scheduled IOC dates of CSOC's MCCs, Feb 87 and May 88. DSM development of hardware and software for the AFSCF's STC and CSOC's SOC has no bearing on NASA's ability to prepare for or launch Space Shuttles, regardless of classification. The DSM operational capability is essential to the on-orbit operation of some classified satellites planned for launch on the Space Shuttle. Therefore, a delay in DSM could result in a delay of launch of these satellites. This currently is not a concern. Development of hardware and software for CSOC's Shuttle Operations and Planning Complex (SOPC), which is totally unrelated and independent of the DSM software development, paces CSOC's ability to share the Space Shuttle flight support burden. If DSM development or delivery falls significantly behind schedule, the initial operational capability dates for CSOC's satellite MCCs #1 and #2 could be impacted. Delay of MCC activation at CSOC would in turn delay transfer of selected satellite operations from the Satellite Test Center in Sunnyvale, AFS CA, to the CSOC MCCs, however, this would not necessarily adversely affect satellite operations.

*Question.* One the initial purposes of the CSOC was to provide the military sufficient capability to plan and manage Shuttle operations, so that DOD would not have to rely on NASA. Now the FY 1987 budget back-up books refer to an "austere" Shuttle planning and operations capability. What functions will not now be performed that were originally planned? Will the Air Force need to continue to rely on NASA for mission-critical Shuttle planning and operations?

Answer. The Shuttle flight readiness function will not be performed at CSOC. This function includes Shuttle and network simulation, flight software generation and validation and flight data base maintenance. The Air Force will gain the ability to plan and control Shuttle flights from CSOC via the development and acquisition of the austere SOPC. However, due to the lack of the readiness function, SOPC's operations must be integrated with the readiness activities of NASA's Johnson Space Center. Shuttle flight software and data bases for each SOPC-related flight will originate at JSC, and Shuttle flight software will be validated at JSC. Shuttle crew, ground control personnel, Shuttle systems and ground systems readiness will be verified by simultaneous, combined efforts of both SOPC and JSC.

*Question.* How does this "austere" capability affect the cost-effectiveness of CSOC? Given that NASA has increased security and will be upgrading its controlled mode at the Johnson Space Center, what is the rationale for a separate Shuttle control capability for the Air Force? If the Air Force builds up its reliance on expendable launch vehicles as a result of the recent Space Shuttle accident, how will that affect the requirement for a separate Shuttle operations planning and control facility?

Answer. As the DOD's space operations facility, CSOC remains cost-effective regardless of the scope of internal Shuttle related activities. The DOD requires security beyond any security envisioned for Johnson Space Center (JSC). Although the equipment upgrade program at JSC will provide additional flexibility and some manning efficiencies, the equipment upgrade will not increase JSC's capacity to the extent DOD's flight requirements can be supported without impacting the civil, commercial and foreign flights planned by NASA. If a national level decision is made to permanently transfer the majority of classified DOD cargo from the Shuttle to Expendable Launch Vehicles, the Shuttle Operations and Planning Complex still helps provided assured access to space by avoiding potential single point failures in our national space program.

*Question.* Why will the Satellite Operations Center (SOC) also contain only "austere" backup to the Satellite Control Facility? How will this limitation affect critical military missions?

Answer. Although in an unconstrained funding environment a more robust SOC capability might have been desirable, the selected operations concept utilizing two Mission Control Complexes (MCCs) satsifies the basic DOD operational support requirements. In the event that the AFSCF's Satelite Test Center (STC) at Sunnyvale AFS, CA is unable to function, both of CSOC's MCCs would be available to perform critical functions for military missions normally operated from the STC.

## JOINT SURVEILLANCE TARGET ATTACK RADAR SYSTEM

*Question*. The Joint Surveillance Target Attack Radar System (JSTARS) is a radar system installed on a C-18 aircraft, which is intended to track stationary and moving ground targets, and provide targeting information to artillery, missile systems, and attack aircraft. Please describe briefly the mission and capabilities of JSTARS.

Answer. The Joint Surveillance and Target Attack Radar System (Joint STARS) is a joint Army/Air Force program to detect and track enemy moving targets in both the first and second echelons. Based on this information Air Force and Army systems will be directed against the targets in order to delay, disrupt or destroy them in accordance with the battle priorities. The Joint STARS consists of both ground and air elements. The airborne element is the C-18 (converted commercial Boeing 707) equipped with a multimode radar, communications, and operations and control equipment. The ground element is the Ground Station Module (GSM) equpped with communications and operator display equipment. The radar can operate in three modes. The first mode is the Moving Target Indicating (MTI) mode used for wide area surveillance. The MTI mode allows the Joint STARS system to "see" targets moving between ———. The wide area surveillance data is broadcast to the GSMs. Army commanders use this data for battlefield management, maneuver, targeting of Corps and Division artillery assets and intelligence purposes. Air Force personnel on-board the C-18 analyze the data and provide updates to intelligence centers for fusion as well as to coordinate attack of Joint STARS targets with appropriate command and control facilities and attack aircraft. In addition, the radar has a fixed target indicating (FTI) mode which allows Joint STARS operators to maintain track continuity of previously detected moving targets for wide area surveillance and targeting purposes. The last mode is the weapons data link mode which allows targeting updates to be passed over the radar to Joint STARS associated weapons and aircraft. In summary, Joint STARS will provide unique operational capabilities which will allow Army and Air Force commanders to see far more of the enemy activity and react to that activity much sooner than is possible today.

*Question*. Isn't the threat to JSTARS in battlefield conditions likely to be high? Is JSTARS expected to operate when it is within range of enemy surface-to-air missile and/or fighter aircraft? How effective can JSTARS be if the threat limits it to part time use?

Answer. The Joint Surveillance Target Attack Radar System (Joint STARS) program elements, including the C-18 aircraft, will be able to operate effectively under the expected conditions in a Central European Region battlefield. Although the threat is expected to be high, the U.S. and NATO defenses will be extensive and the enemy problems associated with detecting, identifying and then exploiting that information by acting against, the Joint STARS platform in the "fog of war" is much more complex than many survivability analyses would indicate. Since almost all stand-off surveillance platform, resupply airlift, aerial refueling operations, defensive counter air missions, etc. are within range of enemy surface-to-air missiles and fighter aircraft, Joint STARS C-18s as well as many other theater mission aircraft, must be protected with defense suppression of the surface-to-air-defenses and defensive counter air missions for protection against enemy fighters performing airborne intercepts. Because the C-18 normally operates ——— from the Forward Line of Own Troops (FLOT), it will have additional protection in the form of a self defense suite and it will receive air interceptor threat warning from the E-3A. If the threat warrants, the C-18 can operate from increased stand-off ranges for those periods of time when increased threat exists. In addition, the Department is progressing with programs to increase the capability to perform the critical Joint STARS mission under extremely sophisticated surface-to-air and air intercept threats possible in the long-term.

*Question.* JSTARS is intended to fly at a stand-off distance of ——— kilometers or more at an altitude of 30,000 to 40,000 feet. Doesn't this intended use contradict the conclusions of various DOD and contractor studies that indicate optimum radar performance occurs when an aircraft flies at high altitudes and as near to the forward edge of the battle field as possible? Are considerations of the threat and survivability of the system forcing a significant reduction in effectiveness of JSTARS?

Answer. Various DOD and contractor studies looking at Moving Target Indicating (MTI) radar performance have shown that a Joint STARS C-18 flying between 34,000 and 43,000 feet at a distance of ——— kilometers or more from the Forward Line of Own Troops (FLOT) can effectively perform the Joint STARS mission. A May 1981 MITRE report on *PAVE MOVER Employment with Surface-to-Surface Missiles* indicated targets in forested and tree-lined road segments of the Fulda area in Germany are easily detected whenever the MTI radar is approximately aligned with the road axis in addition to those areas where the roads are not heavily tree-lined. In 1984, BDM Corporation completed the *Joint STARS Intervisibility* study based on the Fulda regain of Germany. The study showed that a C-18 Joint STARS operating at 35,000 feet over a 12 hour period could direct attacks against each of the 52 battalions which moved during this period. Each battalion could be attacked 12-15 times in areas with 4 minutes or more of continous visibility from the C-18. Over 20 attacks on each battalion could be conducted if the continuous visibility requirement was reduced 1½ minutes. In addition, the Joint Program Office Radar Evaluation Activity (REA) has been used to demonstrate Joint STARS capabilities for terrain and foliage screening prediction, terrain map overlay, history playback, etc. to insure the system has good performance, even in the presence of significant terrain and foliage screening. Although optimum radar performance in terms of grazing angles for terrain and foliage masking is achieved at high altitudes near the FLOT, the maximum grazing angle performance, by itself, will not provide a system which provides a useful MTI wide area surveillance capability. The Joint STARS C-18 design provides a combination of Corps-sized area revisit rate, minimum detection radial velocity and grazing angle characteristics to satisfy the Joint STARS mission. Although a platform operating near the FLOT has better grazing angle characterisics, for survivability it may have to reduce radar emission time and power, to the point it is far less effective than the C-18. In addition, MTI radars such as Joint STARS, are less sensitive to grazing angle effects than imaging radars because there are no image interpretation problems caused by long shadows resulting from terrain, foliage, buildings, etc. at a low grazing angles. The Air Force has examined all of these aspects and determined the Joint STARS C-18 will not suffer a significant reduction in effectiveness at expected standoff ranges from the FLOT.

*Question.* The cost of demonstrating the 2 full scale development aircraft is estimated at over $1.3 billion. By comparison, the estimated cost to refurbish these two aircraft and procure 8 additional systems is estimated to be $1.6 billion. Would it not be possible to achieve the required system development objectives with a less ambitious and less costly full scale development demonstration?

Answer. No, it is not possible to achieve the required system development objectives with a less ambitious and less costly full scale development demonstration. The objective of the Joint STARS full scale development program is much more than a demonstration. The full scale development will result in a fully tested, production-ready, supportable system designed to meet the Services' requirements. In order to achieve a less costly full scale development demonstration, either development of logistics supportability, development of production quality hardware, development of a system to meet Service requirements or the test program to confirm system performance or a combination of these goals must be reduced or deleted. The Department believes these actions are not consistent with sound program management principles.

## JSTARS FREQUENCIES

*Question.* The airborne radar for JSTARS is being developed to use ———. The acquisition strategy also emphasizes modular design to ensure that the radar can be modified for follow-on platforms. Is the ——— radar suitable for the follow-on platforms now being considered? Does the Air Force anticipate any problems in retrofitting the JSTARS into follow-on aircraft?

Answer. The answers to these questions were provided to the committee through special access required classified channels.

*Question.* What is the status of the program now, and when is it expected to be fielded?

Answer. The Joint STARS program is in full scale development. The airborne system contract was awarded to Grumman Aerospace Corporation on 27 September 1985. System Design Review was held in December 1985 and Preliminary Design Reviews will be held in May 1986 for hardware and September 1986 for software. The full scale development program will be completed in September 1990 and a limited operational capability will be fielded in September 1991.

*Question.* Is the Army FY 87 budget request of $63.4 million for procurement of JSTARS ground station modules consistent with the progress of the Air Force components of the System? First delivery of the Army ground station modules will be in October 1988. What will be the status of the Air Force component of the program at that time, and how will the ground station modules be put to use at that time?

Answer. The Army Ground Station Module (GSM) request is consistent with the progress of the Air Force components of the system. In December 1988 the first full-up C-18 deploys and begins government testing. Part of that testing will be performance verification and interoperability of the C-18/GSM data link. In addition, in October 1989 the C-18 will deploy to Europe to perform a Field Test Demonstration (FTD). A significant portion of the FTD is demonstrating the GSM capability to NATO and U.S. field commanders. In order to do this, Army personnel must have had the GSMs in Europe long enough to complete initial development of the operational procedures for the use of both the C-18 and GSM as well as long enough for personnel to have become proficient in operating and maintaining the GSM hardware. Additionally, the GSM will interface with the AN/UPD-7 radar system employed on the OV-1D MOHAWK. The initial operational capability for the GSM is the 4th quarter of FY 1989 to support both AN/UPD-7 interface and the Joint STARS European FTD.

## INTER-SERVICE/AGENCY AUTOMATED MESSAGE PROCESSING EQUIPMENT (I-S/A AMPE) PROGRAM

*Question.* The Air Force has requested $54.6 million to continue development of the Inter-Service/Agency Automated Message Processing Equipment (I-S/A AMPE) program. Initially funded in O&M, the program has been transferred to the RDT&E account to reflect its development nature. The I-S/A AMPE is an element of the Integrated AUTODIN System, and is intended to replace a number of Service and Agency automated message processors and provide the capability to replace AUTODIN switching centers. Last year, the Air Force stated its intention of letting two development contracts, to be followed by a "compute off" between the competitors. The Air Force said that this would result in lower costs. Why was only one contract let? What will the lack of competition add to the cost of the program?

Answer. The Air Force intended to select two contractors for the 44 month design period to reduce the technical risk and obtain any reductions in life cycle operation and support cost. After evaluating the proposals, however, the Air Force determined that the two unsuccessful offerors were deficient in key technical areas and that carrying a second contractor would cost $129 million. The DOD IG found the Air Force's action appropriate.

There should be no increase in cost. Analysis showed that in order to offset the cost of carrying the second contractor, the production costs of the winning contractor would have to be lowered by $129 million. Because the production price had already been lowered as a result of the initial competition, the Air Force believed further significant reductions would be unlikely.

*Question.* The current AUTODIN switching centers have recently been modified and modernized. How much has been spent on these efforts over the last five years? To what approximate years has the operating life of these centers been extended?

Answer. Approximately $8 million has been expended for front end processors, high speed printers and replacement of fixed head discs for the leased CONUS AUTODIN Switching Centers (ASC's). Approximately $500,000 has been expended on the overseas ASC's modification for software translation upgrade.

The modifications and modernization of the current ASC's is a means to keep the switching centers operational until such time as the Interservice Agency Automated Message Processing Exchange (I-S/A AMPE) equipment can be fielded. The I-S/A AMPE is currently scheduled for initial fielding in the early 1990's; therefore, the modifications are intended to keep the ASC's operationally viable until the 1995 timeframe.

*Question.* Bulk data message traffic now passed by AUTODIN will be handled in the future by the new Defense Data Network (DDN). How much bulk data message traffic is now handled by AUTODIN? How much of that traffic will be handled in the future by the DDN? When will the DDN begin handling bulk data message traffic? What effect will this transfer have on further extending the operational life of the AUTODIN switching centers.

Answer. AUTODIN currently handles approximately 835,000 bulk data messages a year (341,180,700 line-blocks). This equates to .35% of the total messages and 1.8% of the total lineblocks processed during the year.

DDN is capable of handling the above described volume of bulk data traffic.

DDN can handle bulk data now. Customers using current manual methods may require some change to applications programs in order to use the automatic DDN service.

The transfer of bulk data traffic functions from AUTODIN to DDN has no bearing on the operational life of the ASC's. The required operational life is largely dependent upon fielding of the I-S/A AMPE.

*Question.* Explain how the Air Force's approach to I-S/A AMPE will promote standardization. Will only standard software be used, or will systems be tailored to include existing software programs or architectures? Will message preparation and handling procedures by standardized?

Answer. The maximum standardization was accomplished in the development of the I-S/A AMPE Solicitation Package. Examples are: the elimination of several user-unique protocols and message formats; having one set of hardware and software; and establishing a single formal training program.

Only standard configuration-managed software will be used.

A major operational improvement to be realized with the I-S/A AMPE system is the standardization of message preparation and handling procedures and practices.

*Question.* Why will the initial implementation of I-S/A AMPE not provide for consolidation of general service and special intelligence communications centers? At what date in the future will such consolidation be possible?

Answer. During the program initiation cycle, it was decided that since the criteria for full consolidation were not fully specified, the overall program risk could be reduced by following a two track approach. Track I will yield separate general service and special intelligence community systems, while Track II pursues full consolidation. The link is the preplanned product improvement (P3I) technique, which allows the Track I systems to be upgraded as necessary to meet full consolidation criteria. It may turn out that no upgrade is necessary. The full consolidation criteria are still being developed by the system certifiers and accreditors (Joint Chiefs of Staff, National Security Agency, Defense Intelligence Agency, and Defense Communications Agency).

No date has been established for achieving full consolidation. This decision is pending development of the consolidation criteria.

*Question.* Air Force documentation indicates that when acquisition and operating costs are considered the I-S/A AMPE will cost $1.4 billion more than the alternative of upgrading existing equipment. What advantages does I-S/A AMPE offer which are considered to be worth $1.4 billion? With competitive development no longer being pursued, has this cost differential of $1.4 billion been increased?

Answer. The I-S/A AMPE system will not only meet validated operational requirements and provide improved survivability and standardization, it is the only option that could meet the multilevel security requirements.

No, the cost differential has not increased. The current approach with one contractor is expected to yield the same operational I-S/A AMPE capability at a lower, not higher, cost.

## ELECTRONIC COMBAT PROGRAMS

[CLERK'S NOTE.—Classified questions and answers removed.]

## SEEK RAM

*Question.* The Air Force's fiscal year 1987 budget request includes $52.6 million for SEEK RAM, an electronic countermeasures pod program.

When does the Air Force intend to restructure the SEEK RAM program?

Answer. The current Request for Proposal is being modified to address a Design to Cost approach for release in June 1986.

*Question.* How will the restructured program affect the fiscal year 1987 request for $52.6 million?

Answer. As soon as we receive schedule and funding updates we will provide you with FY 1987 requirements.

*Question.* How will the restructured program change the cost and schedule of the current SEEK RAM program?

Answer. The SEEK RAM Design To Cost program is currently being structured by Headquarters Air Force Systems Command (HQ AFSC) and Aeronautical Systems Division (ASD). When the results of that restructuring is known, we will provide you with cost and schedule updates.

*Question.* How will the USAF ensure that a less costly pod configured jammer will meet the performance requirements of the Tactical Air Command (TAC)?

Answer. The SEEK RAM restructuring program is a fully coordinated effort with TAC inputs. The effort would not be instituted w/o TAC concurrence.

*Question.* How much is budgeted in all appropriations by appropriation for SEEK RAM in fiscal years 1985 to 1987?

Answer.

| | Fiscal year 1985 | Fiscal year 1986 | Fiscal year 1987 (millions) |
|---|---|---|---|
| R&D funding | 0 | $349,000 | $52.6 |
| Production | 0 | 0 | 0 |

### IMAGERY TRANSMISSION

*Question.* The Advanced Deployable Digital Imagery Support System (ADDISS) is a program to study, develop, procure, and field a system to provide tactical operational commanders rapid access to relevant imagery intelligence. The FY 87 RDT&E descriptive summary indicates that only one ADDISS system will be procured at a cost of about $15 million and ———. Last year's budget item justification (Exhibit P-40) disclosed a tentative plan to procure the ———. In response to a question submitted for the record during last year's appropriations hearing, Air Force officials reported that alternative ADDISS procurement strategies were being studied as directed by the Assistant Secretary of Defense ($C^3I$). What are the distinctions between the ———.

Answer. The objective of the ADDISS program is to provide a transportable tactical capability to receive and exploit (hardcopy and softcopy) ———.

*Question.* If the Air Force procures only one ADDISS unit, will it be sufficient to meet Air Force needs?

Answer. One ADDISS unit will not meet the Air Force requirements. In addition to the system already programmed ———. SAC has also identified a requirement within the General Defense intelligence Program (GDIP) to procure four softcopy exploitation segments of ADDISS (designated the Advanced Ground Exploitation System (AGES)). The US Marine Corps has joined the ADDISS program and has a requirement for 9 ADDISS systems (referred to as All Source Imagery Processor (ASIP) by the Marine Corps. The Navy is also investigating the ADDISS's capability to meet their requirements and have indicated that they will join the program. Their ADDISS systems will be referred to as Fleet ASIP and we expect them to have a requirement for 6 to 8 systems.

*Question.* What is the funding estimate for the ADDISS Preplanned Product Improvement ($P^3I$) program? When will this effort begin?

Answer. Funding estimates for the $P^3I$ efforts have not yet been defined. We expect to begin developing these estimates in FY 87. Additional $P^3I$ efforts may include the development of a processing segment to support [———] and other future tactical, strategic, and theater airborne sensors.

*Question.* What were the results of the Air Force's 1985 alternative procurement strategies?

Answer. The initial AF plan was to procure an ———. Due to ——— contractual problems and funding reductions by Congress, the Air Force explored alternative solutions to our requirements. The alternative selected was ADDISS. The Air Force conducted a three-month study to define the best approach for the ADDISS acquisition. That study was completed in June and proposed an Air Force-led program to acquire a modular system with a CY 88 IOC. Contract award of three design contracts was executed on 5 Mar. 86.

## INFRARED SEARCH AND TRACK SYSTEM

*Question.* The Infrared Search and Track System (IRSTS) is a joint Air Force/Navy development designed to provide capabilities to detect and track distant airborne targets. The development was directed toward the Air Force F-15 and the Navy F-14 aircraft.

The FY87 request for the IRSTS is $49.5 million with $35.5 in the Air Force budget request and $14.0 million in the Navy request. In FY86 $32.9 million was appropriated ($23 million-Air Force and $9.9 million-Navy) for the system.

On March 13, 1986, the Tactical Air Command, planned user of the system, notified the Aeronautical Systems Division, Air Force System Command, developer of the IRSTS that:

* * * "We don't think the F-15 IRST program has progressed sufficiently to enter full-scale development. Considering its cost, lengthy development schedule, and F-15 availability, we doubt seriously whether modification of the F-15 will ever occur[1]. Further, we do not believe we can afford to have two IRST programs, one aimed at the F-15 and a completely different one for the ATF[2]. We believe a single IRST program should be structured for the AFT. Should this program be compatible for retrofit on F-15's, then we will consider that at a later date." * * *

As a result of the above, a request for proposal to do full-scale development work on the IRSTS was withdrawn. The program is on hold waiting direction from the Air Staff, and a new funding profile to be defined.

Navy official stated that they still have plans to put an IRSTS on the F-14, but have not yet restructured the funding profile.

What are the Air Force plans for the Infrared Search and Track System? Which aircraft will use it? What are the funding requirements for FY 86 and FY 87? What happened to the money originally budgeted in FY 86 and FY 87 for the IRSTS?

Answer. This is a joint Air Force (AF) and Navy development program of a fighter Infrared Search and Track System (IRSTS). Subsequent to the FY 87 budget, the AF reviewed the program status. Because of concerns over high retrofit cost projections and lengthy retrofit schedules associated with the F-15, the AF reoriented its position of this joint AF/Navy program. The AF portion of this joint effort is now aimed towards a risk reduction program based on current technology. The restructured joint program will: (1) continue joint engineering development efforts to support the F-14D IRSTS Full Scale Development (FSD) schedules and; (2) support the Advanced Tactical Fighter (ATF) and Navy Advanced Tactical Aircraft (ATA) programs by continuing an IRSTS demonstration validation effort which will provide the basis for defining ATF/ATA development and operational requirements. The only aircraft currently programmed for production incorporation of this system is the Navy F-14D.

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[1] The cost to modify the F-15 to accept the IRSTS is included in the $35.5 million Air Force FY87 budget request.

[2] ATF stands for Advanced Tactical Fighter. An IRSTS is contemplated for the ATF.

The USAF funding requirements for the joint restructured program remain the same as previously programmed (FY 86: $23.1 million; FY 87: $34.8 million). The deletion of the F-15 FSD integration requirements does not remove the need for the AF to complete the planned risk reduction phase at the front end of the joint development program to support the two objectives as listed above.

## FEDERAL AVIATION ADMINISTRATION/AIR FORCE RADAR REPLACEMENT (FARR) PROGRAM

*Question.* The Joint Surveillance System Federal Aviation Administration/Air Force Radar Replacement (JSS-FARR) program is designed to replace 1950's technology, two dimensional surveillance and height finding radars with modern, highly reliable, unattended three dimensional radars. The procurement cost will be shared equally by the Federal Aviation Administration (FAA) and the Air Force. FAA will assume ownership and maintenance responsibility.

Entering a joint program allows the Air Force to upgrade radar performance and to procure radars with integral height finding capabilities. Height-finding ability is an Air Force specification; FAA has not identified a need for height-finding radar. The current Joint Surveillance System radar equipment is vaccum tube vintage and requires manpower-intensive maintenance. Newer equipment will result in lower operations costs for the Air Force regardless of whether height finding capability is provided. However, adding height finding capability greatly increases system costs. In fact, FAA testified that a two dimensional radar is approximately one-half the cost of a three dimensional radar. Since under the FARR program Air Force and FAA will share equally the cost of 48 sites, Air Force is not facing the full cost of its requirement.

Cost estimates for the Air Force portion of the FARR program differ between the FAA and Air Force. The FY 1987 Research, Development, Test and Evaluation descriptive summary shows the total estimated cost for the Air Force to be about $226.7 million. December 1985 FAA data projects total Air Force cost at $369.5 million, with FAA costs the same. Money is being provided through program element number 12325F and P-1 Line Item 206.

The committee may want to question the validity of Air Force's requirement for three-dimensional radars at all locations. We understand that Air Force uses these radars primarily for their peacetime air-sovereignty mission. Conversely, if these radars are to enhance our air defense capability, they are notably deficient because they lack ECCM and they are sited too low to provide effective warning against low altitude attack. The Air Force currently plans to acquire unattended radar systems, while budget justification documents (including the descriptive summary for fiscal year 1986 Research, Development, Test and Evaluation funds) specify that these systems will be minimally attended. The committee may want to further question the Assistant Secretary regarding the cost implication of these radar systems being unattended in comparison to minimally attended systems.

Will JSS-FARR expand the area for which Air Force has height-finding radar coverage? If so, what mission is not being performed that necessitates expanding three-dimensional coverage?

Answer. Air Force height-finding radar coverage requirements for FARR are the same as current heightfinding radar coverage requirements. At four of the planned FARR sites, heightfinding radar coverage will be an improvement over the existing capability.

*Question* How is the two dimensional radar deficient in addressing this problem? What would be the effect if all JSS-FARR sites only provided two dimensional coverage?

Answer. A two dimensional radar does not provide the Air Force required height-reporting information. If all FARR sites provided only two dimensional coverage, the Air Force would need to retain current height-finder radars or develop an alternative method for height-reporting in order to perform the air defense mission.

*Question.* As interceptors are replaced, won't the newer aircraft have sufficient on board radar capability that the third dimension in the ground based radar will not be necessary to find the target?

Answer. The presently defined FARR height-reporting accuracy was specified after considering the radar capability of current, and planned, interceptors. Additionally, the height-reporting capability was defined as it relates to air defense assessments independent of intercept(s) (e.g., flight plan correlation for identification of air traffic) and as it relates to ———.

*Question.* What is the additional cost of satisfying the three dimension requirement? How much cost results from putting three dimensional ability in locations that now lack it?

How can the extra cost of the third dimension at all locations be justified when the air sovereignty mission is being performed now and it is likely to performed better as the air defense fleet is modernized?

Could the additional funds required for the third dimension be better spent on other command and control or warning requirements?

Answer. The Air Force has not conducted an analysis to determine the cost difference between a two dimensional FARR radar and a three dimensional FARR radar. The Air Force has a requirement for height-reporting. Providing the third dimension in a single radar is more cost effective than the current use of two separate radars. Current FARR cost estimating is based on a radar specification that is mutually agreeable to the FAA and the Air Force. The specification is compatible with the mission needs of both the FAA and the Air Force.

*Question.* The Aerospace Defense Command $C^2$ Master Plan states that the upgraded FARR will only provide minimal low altitude air defense capability. If so, why is there a requirement to detect radar cross sections as small as ———.

How far from the radar site will the FARR be able to detect ——— targets that are approaching at an altitude between 50 and 200 meters?

Answer. The low-altitude detection performance of the FARR radar primarily relates to line-of-sight limitations of this type of radar in general, and not the radar cross section of the target. The Air Force mission for the FARR radar is peacetime air sovereignty ———. This requirement is within the state-of-the-art of solid-state three-dimensional radars, and it will not be a cost driver. Based on target altitude considerations only and assuming the radar is sited 15 meters above the surface, a target at an altitude of 50 meters will be at the radar horizon at approximately 28 miles from the radar and a target at an altitude of 200 meters will be at the radar horizon at approximately 46 miles from the radar.

*Question.* What is the added cost of requiring detection of small cross section targets?

Does this ability add to the warning time for a ——— attack? How much warning is added?

Answer. Given the state-of-the-art of solid-state three dimensional long-range radars, the required detection of a ——— target within the conditions stated in the FARR specification is not a cost-driver. The radar's detection performance against this type of target complements the detection performance of the longer-range OTH-B system by providing attack confirmation and contributing to attack assessment.

*Question.* Why do the FARR requirements exclude the need for an ECCM capability?

What is the impact on the military of these radar systems without ECCM capability?

Answer. The Air Force mission for the FARR radar is peacetime air sogereignty ———. The specification requires a radar capable of performing the assigned mission.

*Question.* Is the Air Force sacrificing surveillance coverage in the replacement program? If so, what is the effect of this reduction in surveillance coverage?

Answer. The Air Force is not sacrificing surveillance coverage.

*Question.* Are there any other requirements not included in FARR which affect the military usefulness of these radar systems?

Answer. As currently specified, this radar is militarily useful and the specification requirements are compatible with the current and projected mission for the radar.

*Question.* Given the weakness in FARR's ability to perform the low altitude air defense mission, shouldn't Air Force either drop the requirements for small target detection and height finding ability or add ECCM and re-site the radars so they can provide true cruise missile warning ability?

Answer. The primary mission of the FARR radar for the Air Force is to control access to sovereign airspace in peacetime. This mission requires height information, both for flight plan correlation and intercept control. Small target detection, as stated in the FARR specification, will not be a cost driver.

*Question.* If improvements were made to the FARR design and siting strategy, could FARR be cost-effective alternative to OTH-B? Although FARR does not detect objects as distant as OTH-B, isn't this shortcoming more than offset by FARR's greater likelihood of detecting objects within its range?

Answer. FARR is not a cost effective alternative to OTH-B. FARR and OTH-B radar systems contribute to different portions of the air defense mission and complement each other for air defense purposes. OTH-B provides long-range surveillance for tactical warning. FARR radars will provide surveillance for the Air Force airspace sovereignty/air defense mission and the FAA's airspace management/safety-of-flight mission.

*Question.* Are there intelligence systems which could provide strategic warning of a long-range bomber attack? Wouldn't such a capability remove any possible advantage of OTH-B over an improved FARR?

Answer. ———. FARR radars will provide surveillance for the Air Force's airspace sovereignty and air defense missions and the Federal Aviation Administration's airspace management/safety-of-flight mission.

*Question.* Budget justification documents, to date, indicate that the FARR systems will be minimally attended. Air Force program officials now indicate that these systems will be unattended. How does the unattended radar system approach affect the projected costs for developing and acquiring FARR systems?

Answer. The radar's reliability and maintainability (R&M) requirements have been specified in a manner to allow the radar to interface with the FAA's National Airspace System 1990's maintenance concept. That is, since the terms "minimally attended" and "unattended" are subject to varying interpretations, the Air Force and the FAA prefer to describe the radar's R&M requirements in quantitive terms instead. Also since the FAA will have maintenance responsibility when the new radars are in place, we believe an Air Force-developed comparison of life cycle costs of unattended radars versus minimally attended radars would not accurately describe the costs and benefits for these alternatives at the federal level; i.e., for both the Air Force and the FAA. Cost/benefit analyses have confirmed a favorable benefit/cost ratio from the FAA/Air Force viewpoint over the radar's life cycle for the currently specified radar compared to the existing system. The Air Force believes its investment will be fully amortized in less than ten years.

*Question.* Has a life cycle cost analysis comparing minimally attended and unattended radars been done? If so, what are the results of the analysis?

Answer. The radar's reliability and maintainability requirements have been specified in a manner to allow the radar to interface with the FAA's National Airspace System 1990's maintenance concept. That is, since the terms "minimally attended" and "unattended" are subject to varying interpretations, the Air Force and the FAA prefer to describe the radar's R&M requirements in quantitative terms instead. Since the FAA will have maintenance responsibility when the new radars are in place, we believe an Air Force-developed comparison of life cycle costs of unattended radars versus minimally attended radars would not accurately describe the costs and benefits for these alternatives at the federal level, i.e., for both the Air Force and the FAA. Cost/benefit analyses have confirmed a favorable benefit/cost ratio from the FAA/Air Force viewpoint over the radar's live cycle for the currently specified radar compared to the existing system. The Air Force believes its investment will be fully amortized in less than ten years.

*Question.* FAA contract procedures may allow FAA to combine development and production efforts under one contract. Since FAA is the executive agent for the FARR systems, will the acquisition strategy follow typical Defense Department acquisitions.

If not, what is the risk of committing to a full scale engineering development program and a production program under one contract?

Answer. The procurement will be in accordance with federal acquisition regulations. Additionally, since the FAA is the lead acquisition agency, FAA acquisition regulations will be applied. After a comparison of the present radar specification against the performance of currently available commercial solid-state long-range radars, the technical risk associated with this program has been assessed as low. This has been confirmed by independent engineering analyses. Therefore, the FAA and the Air Force plan a production contract award with a suitably tailored qualification and acceptance test program.

[Clerk's note.—End of questions submitted for the record.]

Colonel Foster. Thank you very much.

Mr. Chappell. Thank you very much for a very fine presentation.

TUESDAY, APRIL 22, 1986.

# CHEMICAL WEAPONS

## WITNESSES

DR. THOMAS J. WELCH, DEPUTY ASSISTANT TO THE SECRETARY OF DEFENSE, CHEMICAL MATTERS

MRS. AMORETTA M. HOEBER, DEPUTY UNDER SECRETARY OF THE ARMY

COL. GEORGE A. CARRUTH, USA, CHIEF, CHEMICAL AND NCB DIVISION, NUCLEAR AND CHEMICAL DIRECTORATE, OFFICE OF THE DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS, DEPARTMENT OF THE ARMY

REAR ADM. JAMES H. FLATLEY III, USN, DIRECTOR, STRIKE AND AMPHIBIOUS WARFARE DIVISION, OFFICE OF NAVAL WARFARE, DEPARTMENT OF THE NAVY

CAPT. RICHARD MARSDEN, USN, PROGRAM MANAGER, BIGEYE, NAVAL AIR SYSTEMS COMMAND, DEPARTMENT OF THE NAVY

## OPENING STATEMENT

Mr. MURTHA [presiding]. The Committee will come to order.

This morning the Committee considers the budget for chemical weapons programs. In fiscal year 1986, Congress provided appropriations to initiate production of the Army's binary chemical artillery projectile. In addition, production facility funding was provided for the BIGEYE binary chemical bomb. All production related funding, however, was made subject to numerous restrictions and reporting requirements. In addition, the Congress required that the Department of Defense submit a plan for destroying all unitary chemical munitions by 1994.

The fiscal year 1987 budget includes initial production funding for the BIGEYE and the second year production funding for the GB-2. Additional production facility funds are also requested. Finally, a new appropriation of $120 million is proposed for the destruction of chemical munitions.

The principal witness is Dr. Thomas J. Welch, Deputy Assistant to the Secretary of Defense for Chemical Matters. Accompanying him, representing the Army, is Mrs. Amoretta Hoeber, Deputy Under Secretary and Col. George A. Carruth, Chief of the Chemical and NBC Division, Office of the Deputy Chief of Staff for Operations and Plans. Representing the Navy is Rear Adm. James H. Flatley III, Director of Strike and Amphibious Warfare, Office of Naval Warfare.

We welcome you, Dr. Welch. Your entire statement will appear in the record, if you will summarize for us, and then we will get to the questions.

## SUMMARY STATEMENT OF DR. WELCH

Dr. Welch. Thank you, Mr. Chairman. It is a pleasure to be here and talk about this topic of importance to you and to the rest of the Congress.

I should first thank you for your action last year in working out the carefully conceived language in the appropriations bill that led to a decision to produce binary chemical weapons, and at the same time help us in arms control, in raising the nuclear threshold, strengthening NATO and helping us out with a safety concern.

We need your help this year to tie up loose strings to continue on this path of deterrence.

[Chart follows:]

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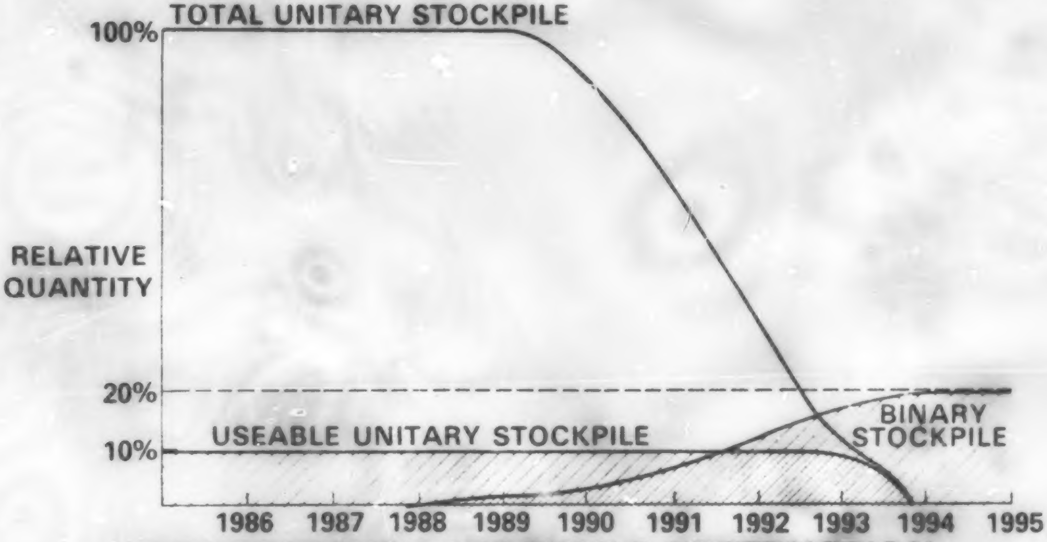
# DOD CHEMICAL PROGRAM



COORDINATED STOCKPILE DESTRUCTION AND MODERNIZATION

Dr. WELCH. The first vugraph will talk about some of the points that I will cover. You will recall our plan is to destroy what is known as the unitary stockpile for safety reasons and mostly for lack of military utility.

At the same time we destroy it, we will produce binary munitions, and we will do this in such a way that the unitary munitions that are destroyed last are the 3 to 10 percent that have some limited military utility.

After sufficient binary munitions are built up, we will destroy the remaining unitary stocks. The buildup will amount to something on the order of ——— of today's stockpile, a much smaller stockpile, but more useful.

[Slide follows:]

# CONSTRAINTS ON ACQUISITION OF BINARY MUNITIONS

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| ACTION | INTERESTS/PARTICIPANTS |
|---|---|
| NATO CONSULTATIONS<br>– FORCE GOAL<br>– DEPLOYMENT PLAN<br>– STUDIES | OSD, STATE, NATO, ALLIES, OJCS, SERVICES |
| STORAGE AND TRANSPORTATION PLANS | OSD, OJCS, SERVICES |
| DESTRUCTION PLAN | OSD, SERVICES, DHHS, DOT, OJCS, AFFECTED STATES, EPA |
| HANDLING, STORAGE, SAFETY SPECIFICATIONS | OSD, SERVICES, EPA, DOT, DHHS |
| SECRETARY OF DEFENSE REPORT BIGEYE | OSD, SERVICES, GAO |
| PRESIDENTIAL CERTIFICATIONS<br>– ON CONSULTATIONS<br>– ON STUDIES<br>– NATIONAL SECURITY INTEREST | OSD, STATE, NSC, SERVICES, OJCS |

Dr. **Welch**. My next vugraph talks about some of the legislative requirements that appeared in last year's language. I will talk a little bit about the NATO consultations, borrowing from Ambassador Abshire's written statement on how they are going, and discuss a bit about arms control progress.

I am pleased to note that David Emery, the Deputy Director of the Arms Control and Disarmament Agency, has submitted a statement this morning.

Mr. **Murtha**. His statement will appear in the record without objection.

[The statement of Mr. Emery follows:]

UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY
Washington, D.C. 20451

OFFICE OF
THE DEPUTY DIRECTOR

April 21, 1986

Dear Mr. Chairman:

I understand that the Defense Subcommittee is holding a hearing on April 22 on chemical weapons modernization. Attached is a statement on chemical weapons arms control which I would like to submit for the record in the hope that it will be useful to the Members.

With my best wishes.

Sincerely,

Dave Emery
David F. Emery

Attachment:
as stated.

The Honorable
Bill Chappell, Jr.
Acting Chairman
Subcommittee on Defense
Committee on Appropriations
House of Representatives

# STATEMENT OF DAVID F. EMERY

DEPUTY DIRECTOR

U.S. ARMS CONTROL AND DISARMAMENT AGENCY

SUBMITTED FOR RECORD

TO

SUBCOMMITTEE ON DEFENSE

HOUSE APPROPRIATIONS COMMITTEE

APRIL 22, 1986

I am pleased to have the opportunity to discuss the activities of the United States on the subject of chemical weapons arms control. This is a subject to which we attach considerable importance. We welcome the interest of the House.

Today I plan to discuss the several different efforts we have underway to control chemical weapons and their use. I'll touch on the use of CW in the Gulf war, review one of the key verification issues in the negotiations, and comment on the connection between the U.S. chemical weapons modernization program and the negotiations.

The three issues that the U.S. is concerned with in the area of chemical weapons (CW) arms control are: compliance with existing international agreements; checking the dangerous spread of chemical weapons around the world; and negotiating a comprehensive and verifiable, world-wide ban.

The U.S. is a party to two international arms control agreements affecting chemical weapons. The first is the Geneva Protocol of 1925, which prohibits the use of chemical and biological weapons in war, but does not preclude their development, production, and stockpiling. Additionally, we have ratified and have completely adhered to the Biological and Toxin Weapons Convention of 1972 which bans biological and toxin weapons, but does not cover chemical weapons. Unfortunately, neither one of these agreements contains the necessary provisions for dealing with problems in compliance.

We are now confronted with some particularly disturbing international trends, which cumulatively have resulted in a gradual erosion of the moral and legal sanctions against these weapons. In 1963, approximately five states had CW stockpiles; the figure has now risen to at least sixteen. The fact that incidents of use are clearly on the rise is an even more disturbing matter. Over the last several years, we have seen the Soviet Union employ toxins in Afghanistan and become involved with use of toxins by their clients in Southeast Asia. Furthermore, in 1984, 1985, and 1986, lethal chemical weapons were used by Iraq against Iran. And practically as I speak, CW are again being used by Iraq. In both of these cases we are not just talking about isolated incidents, but rather multiple violations of the Geneva Protocol. In the case of Afghanistan and Southeast Asia, the 1972 Biological and Toxin Weapons Convention has been violated as well. The United States has frequently condemned the use of CW, and will continue to do so at every opportunity.

In late February, the U.N. Secretary General dispatched an investigating team to Iran and its report concluded that on many occasions, Iraqi forces had used mustard gas against Iranian forces. The U.S. strongly supports impartial international investigations of reports of CW use, such as the aforementioned efforts initiated by the U.N. Secretary General. However, we are deeply concerned by the absence of worldwide outrage over the breaches that have been documented. While Western delegations in the Conference on Disarmament will jointly condemn Iraqi use of CW, others have remained silent. Unless countries call violators to account, the norm against CW use will continue to erode. The world is in a race against time to eliminate these weapons before they have spread beyond the point of no return.

The best solution to the threat of chemical warfare would be to eliminate chemical weapons from national arsenals. We are presently engaged in several negotiating efforts, the total effect of which we hope will result in a total ban of CW. Since 1981, our primary emphasis has been on multilateral negotiations in the 40-nation Conference on Disarmament (CD) in Geneva. We participate very actively in this work and have made a number of major initiatives. In 1984, Vice President Bush tabled a draft convention which remains the most comprehensive model for an eventual ban of CW. In 1984, as a complement to the multilateral negotiations, the U.S. and the USSR re-established bilateral talks, primarily aimed at exploring ways to ensure confidence in each other's compliance with prospective treaty provisions.

At the November 1985 Summit, President Reagan and General Secretary Gorbachev agreed to accelerate bilateral discussions on a comprehensive CW treaty and to establish a dialogue on the spread of chemical weapons. I can happily report that both of these efforts are already underway.

In late January and early February, U.S. and Soviet negotiators held intensive bilateral meetings on the margins of the Conference on Disarmament in which several key issues were discussed. The U.S. pressed unsuccessfully for clarification of the January 15 Gorbachev remarks on CW. The Soviet attitude in these talks has been business-like and non-polemical, but not forthcoming. Since the treaty would allow ten years for destruction of stocks, Gorbachev's statement that chemical weapons should be eliminated by the end of this century implies that the treaty negotiations would be completed in the next couple of years. This would require considerable acceleration of the current slow pace. The main issues which separate the two sides remain the same and relate largely to verification but we have noticed a slow advance on technical matters. We expect to hold another bilateral round soon.

The foremost issue of disagreement in the negotiations is challenge inspection. Unfortunately, chemical weapons production facilities don't look much different from ordinary chemical factories, and chemical weapons stockpiles are very easy to hide. Distinguishing between activities that would be prohibited by a CW ban and permitted activities will be very difficult at best. The U.S. continues to believe that a provision for short notice, mandatory challenge inspection of suspect facilities is a necessary component of a system for dealing with concerns about treaty compliance. A key feature of our treaty proposal is the right to demand a challenge inspection of any military and government-owned facilities, or relevant privately owned facilities to clarify suspected violations. Under such an "open invitation" arrangement, the U.S. would be permitted to inspect any relevant facility in the Soviet Union or elsewhere that was of concern to us. Likewise, the Soviets could visit any relevant U.S. facility whether or not it was directly related to CW. We recognize that this verification measure is more intrusive than those we have requested in other arms control negotiations. But we believe that because of serious problems of dealing with undeclared facilities in a CW treaty, such an unprecedented measure is fully warranted.

The U.S. believes that for a challenge inspection provision to be useful in deterring violations, it must not only guarantee prompt access into all facilities where a violation may be suspected, but it also must be conducted in such a manner as to provide a high degree of confidence that it will furnish the information necessary to determine whether a violation has occurred. We realize that the degree of access required for an effective inspection may result in the loss of some proprietary or national security information not related to CW. After all, we are talking about some very sensitive U.S. activities. While this cost can be minimized, the U.S. believes that this potential loss is a price that must be paid for an effective convention. This conclusion has been adopted at the very highest levels of the Executive Branch.

Although the effectiveness of the inspection is the overriding concern, we believe that in most cases effective inspection measures can be devised which will minimize the risk of compromise of sensitive information. Such measures are currently under investigation.

In early March, the U.S. and Soviet representatives met in Bern, Switzerland to exchange views on curbing CW proliferation. The Soviets explained to us the chemical export controls they have recently instituted on certain chemicals which can be used both for peaceful purposes and for chemical weapons. We informed them of our concerns about proliferation and use of chemical weapons and the export control actions we had already taken. We made clear our view that the CW non-proliferation discussions should not be allowed to interfere with negotiations on a complete ban, which is our highest priority. The meeting was a constructive one and it was agreed to meet again once the discussions had been reviewed in Moscow and Washington. I would add that over the past year, the United States has also participated actively in an Australian-led effort to coordinate Western export controls on CW-related precursor chemicals.

Two other prosposals which the Soviets have raised but which the U.S. does not think worthwhile pursuing concern a chemical weapons nonproliferation treaty and a chemical weapons free zone. The U.S. has opposed the suggestions by the Soviets to negotiate a CW non-proliferation treaty. General Secretary Gorbachev suggested in Paris in October, 1985 that the Soviet Union would be prepared to take part in drafting an international accord on the non-proliferation of chemical weapons, along the lines of the nuclear non-proliferation treaty. This was a positive step since it showed Soviet concern about CW proliferation. However, we believe a formal treaty to be inappropriate. While there are some superficial similarities, the chemical and nuclear non-proliferation problems are much different. For example, the technical constraints are much weaker for CW. Additionally, the negotiation of a CW non-proliferation treaty would detract from the achievement of a global ban. A chemical weapons free zone has been suggested by the Warsaw Pact in several forums many times since 1983. The U.S. does not believe that a CW free zone would alleviate the key problems of chemical weapons. Any attempt to negotiate a CW ban applicable only to Central Europe or to all of Europe could undercut efforts in the CD to achieve a worldwide CW ban. Additionally, since chemical weapons could easily be transported into any "free" zone, verification to ensure the zone remained free would be even more difficult than verification of a worldwide ban.

I think it should be clear that we are not only negotiating actively, but are doing so on a number of fronts. Unfortunately, I must also report that we remain unsatisfied with the very slow pace of the negotiations. Despite what some newspaper headline writers would have one believe, an accord is not in hand, or even close. While there continues to be a slow advance on technical issues, the real obstacle remains continued Soviet unwillingness to deal specifically with the really difficult issues surrounding the verification of a comprehensive CW ban.

This brings me to the relationship between our negotiating efforts and the chemical modernization issue. Shortly after the House voted last summer to authorize production of binary chemical weapons, the Soviets greeted this decision with a hail of polemic followed by a silent sulk during which they virtually withdrew from active negotiation. This sort of posturing did not go over well at the CD, and gradually the Soviets were subjected to more and more criticism for it. When the binary production issue continued to move through Congress, the Soviets apparently concluded that we were serious about modernization, and by the end of the CD's Summer Session, had returned to active negotiations. The Soviets have now virtually ceased mentioning binary weapons at all, and when they do refer to them it is only in a descriptive, not a polemical fashion. This seems significant to me.

I do not want to overemphasize the effect the modernization decision has had so far on Soviet actions. There have not been any breakthroughs and a great deal remains to be done before we have an agreement. Yet I think there is already some evidence that the Administration's contention that the Soviets would have little incentive to negotiate seriously until we showed the resolve to modernize, is correct.

The U.S. objective is to obtain a comprehensive, verifiable prohibition on CW that will enhance the security of the U.S., its friends and allies. Until there is such a treaty, the U.S. must protect the security of itself and its allies by maintaining an effective deterrent to CW use. Even though the Soviets are attacking the U.S. binary decision in the CD, we must continue to convince others that we are committed to the treaty process and are not, as charged by the Soviets, merely using the process as a stalling tactic for binary production. As we have explained to our friends and allies, binary production constitutes modernization, not expansion, of a modest U.S. stockpile and is essential to deter Soviet CW use in Europe. If we were to go back on our commitment to modernize, I am very much afraid that the Soviets would return to the posturing and stalling which has characterized their behavior during the late 1970's and early 1980's.

Ladies and Gentlemen, our goal is the total elimination of chemical weapons everywhere in the world. I want to assure you that the Arms Control and Disarmament Agency will do everything within its powers to work diligently and expeditiously to acheive this goal. We look forward to your advice and support as we pursue these negotiations.

### NATO CONSULTATION

Mr. WELCH. Our deployment plan required by the language is on schedule and will meet the required presidential certification.

The concept plan for destruction was submitted the 15th of last month. Deputy Under Secretary of the Army Hoeber is here to answer specific questions on that issue.

Our handling, storage and safety specifications are onging and we see no problem. The Secretary of Defense will report on BIGEYE operational testing after April 30. The presidential certifications on the NATO consultations is expected in July, the report on NATO posture will follow in October. Finally, presidential certification that production is in the national security interest should be in October of 1987.

The status of the NATO consultations is a positive one. NATO continues to recognize the need for a chemical deterrent capability. Ambassador Abshire, I think, has said this well. I would like to quote from his earlier statement on this.

He has said that ". . . NATO consideration of the force goal requiring U.S. binary production is underway. On February 13th, the NATO military committee approved the package of force proposals, including SACEUR's chemical weapons force proposal for the United States.

"The Defense Review Committee, or DRC, must now examine the military committee's force proposal package for each NATO nation with regard to financial, economic and political implications. This review, which includes both bilateral and multilateral consultations, ensures compatability with guidance previously given by ministers. For this year, review of the DRC should be completed by May of 1986."

Mr. Emery's statement submitted today points out that the Soviet reaction to the actual move of the Congresss to modernize our chemical weapons stockpile resulted in Soviet conference on disarmament actions that initially were polemic in nature. This was followed by renewed interest in talks; indeed, this possibly led to the Gorbachev summit statement on chemical weapons.

Although it is premature to point to actual progress, there are some discussions in areas that previously the Soviets refused to discuss and there is little question in our mind that if we intend to see progress in arms control, we are going to have to continue with a move to modernize our stockpile.

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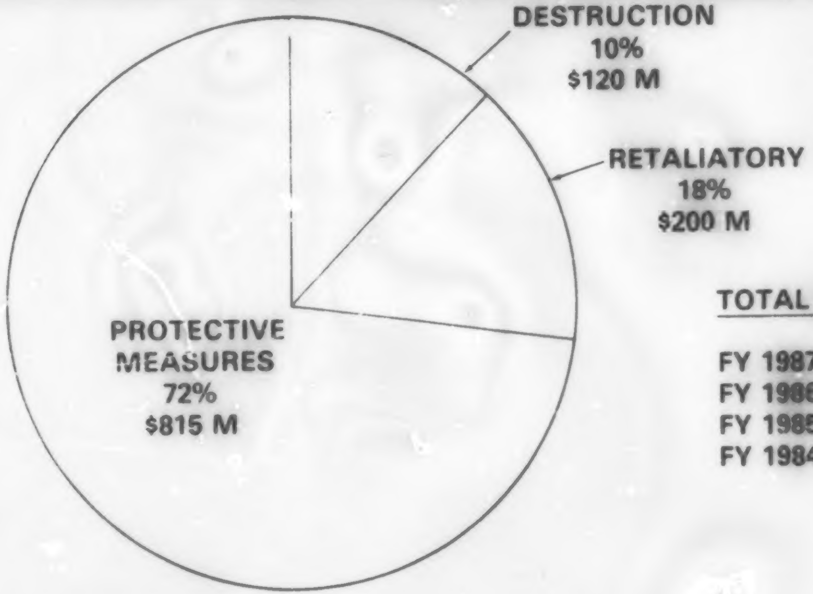
# FY 1987 CHEMICAL WARFARE DETERRENCE PROGRAM



TOTAL REQUEST ($B)

FY 1987: $1.1
FY 1986: $1.3
FY 1985: $1.1
FY 1984: $ .9

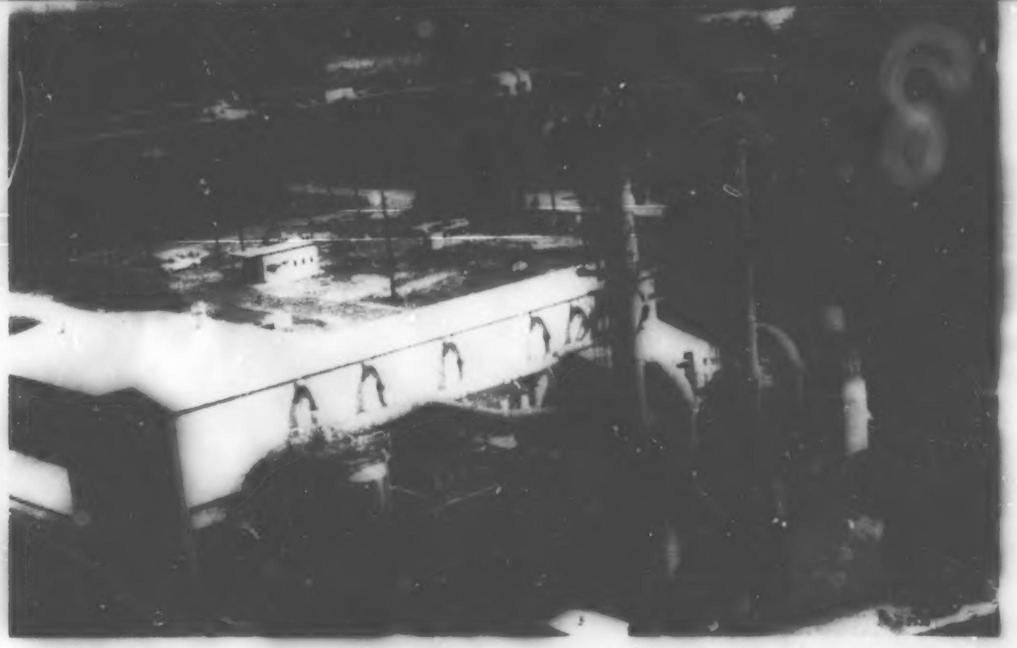
## BUDGET FOR CHEMICAL PROGRAMS

Dr. **Welch**. Here is a slide of our fiscal year 1987 request. As you see, nearly three quarters of it is for defensive systems; for example, masks and detectors. These are especially important given our second-strike policy with respect to chemical weapons. We have got to be certain that our people in the field simply don't appear to be so weak and so defenseless as to invite an attack.

About 10 percent is for destruction; about 18 percent for retaliatory systems. This includes continuation of the procurement of the 155 mm binary artillery projectile, which we started with fiscal year 1986 funds. It includes this year a request for second-year production money and facilities to produce one of the 155 mm binary components.

[Slides follow:]

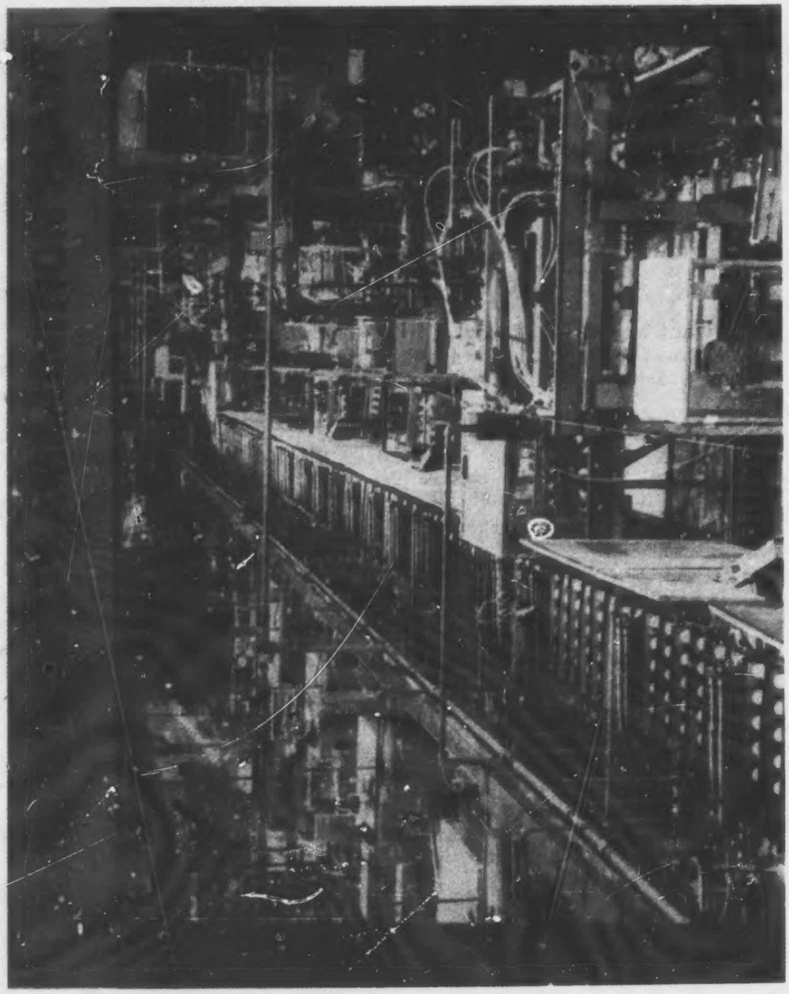
# PHASE I PRODUCTION FACILITY AT PINE BLUFF ARSENAL



**Dr. Welch.** Here is a vugraph of the Pine Bluff arsenal facility, which is going to be used to produce one of the components of the 155 mm binaries. Shown next is the metal parts facility at the Louisiana Army Ammunition Plant. This, too, is ready to be used.

[Slides follow:]

710



Dr. WELCH. Fiscal year 1987 dollars are needed for an expansion of that plant to accommodate the 155 mm artillery binary production.

The BIGEYE bomb request is for $77 million, $57 million for Navy and Air Force initial procurement and $15.4 million for the Army to acquire a second source of metal parts. This will ensure competition, and we believe reduce cost for the BIGEYE bomb.

Finally, $5 million is required to complete the RDT&E, the research, develpment, test and evaluation for BIGEYE. The remainder of the retaliatory program, about $37 million, is for additional research and development on binary warheads for the multiple-launch rocket system as well as for basic research on future retaliatory munitions and agents.

### BIGEYE BOMB TESTING

I want now to say a few things about the different viewpoints of DoD and the General Accounting Office regarding the fundamental test criteria for weapon effectiveness and in particular the BIGEYE bomb.

Our position has been that there is only one measure that must be applied to any weapon: Does a weapon give you substantial improvement in combat effectiveness that you must have? Is it a substantial improvement over what you have in the field today? Our answer for BIGEYE is yes, and I will take a few moments to talk to you about that.

We have looked at BIGEYE in some detail and have tried to work constructively with the GAO audit team that has been charged to do the same thing. On the issue of requirements, we very much agree with the position of the Congress and with the position of the Packard Commission. We disagree with the position taken by the GAO BIGEYE audit team.

The Packard Report, I think, said it well: "Fundamental to the ultimate success of a new program is an informed tradeoff between user requirements on the one hand and schedule and cost on the other. A delicate balance is required in formulating many system specifications that allow for a real advance in military capability, but avoid goldplating. Agency users do not have sufficient technical knowledge and program experience and acquisition teams do not have sufficient experience with or insight into operational problems to strike this critical balance. It requires a blend of diverse backgrounds and perspectives that, because the pressure for goldplating can be so great, must be achieved at a very high level in DoD."

It is my task to represent the Secretary of Defense on chemical matters and to resist this pressure of goldplating. It is my task to demand that we reach the delicate balance between truly needed requirements and cost.

When I look at the BIGEYE bomb, I come to this conclusion: Some of the BIGEYE technical specifications have become surrogates for overstated military requirements.

Let me demonstrate this by way of example. The Services stated a BIGEYE temperature requirement of ———. What is wrong with that? It was arbitrarily selected. Second, if you start with a bomb even at ——— it is impossible to keep it that cold in flight due to the heating caused by air friction in flight. So I am not accepting the Servies' requirement that BIGEYE perform at ———.

The Congress should not approve funds so a system can be made to operate in a temperture extreme it will not experience in combat.

The Services have stated a requirement for BIGEYE agent purity of ———. Let me show you with a slide here why this is not acceptable to me.

You can see that with a decrease in purity along that horizontal axis on the bottom, there is a very small and slow fall-off in the effect of casualty production and that is what this point is all about. Even with a reduction down to a ——— in purity, you are still generating high numbers of casualties. This and other sensitivity analyses performed on BIGEYE requirements show me that it is proper and correct for us to face up to amending those requirements so that they more realistically portray what we are all trying to get, an effective weapon system.

[Clerk's note.—Classified slide removed.]

Finally, the Packard Commission had one last thing to say about this balance that I am trying to present: "The balance presumes a special cooperation between Congress and the Executive to act for substantial improvement of the defense acquisition system."

For me, this is a good example of the time for me to act responsibly and the time for the Congress to act responsibly about these requirements.

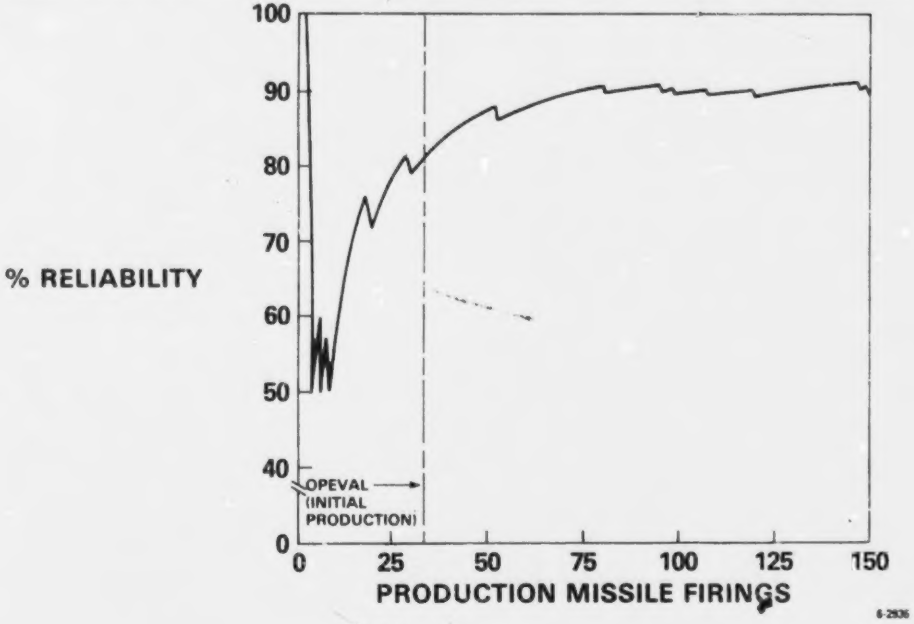
A few last words on the BIGEYE bomb. It has passed its operational test for the Air Force and for the Navy. Both Services point to BIGEYE as potentially operational, effective and suitable; this is the highest rating at this stage of testing that the Services can give the system.

The shortcomings that we have seen in the BIGEYE bomb are understood. We have handles on fixes and they are going to be fixed.

At this point in the development of BIGEYE, it is useful to look at other systems such as the Harpoon missile system and examine its reliability at this point in operational testing. When you do this, you will find that the BIGEYE is comparable in its performance at this state of development to the Harpoon as well as other systems.

[Slide follows:]

# HARPOON MISSILE RELIABILITY GROWTH



Dr. **Welch**. This chart shows some homework done on the Harpoon missile system. There are similar ones for the Rockeye bomb. There is a reliability growth curve over time. We are close to the curve on the BIGEYE bomb and it is an upward trend, and we have full confidence that we will reach the desired reliability goal before we have full production on this system.

The BIGEYE bomb continues to be a special interest item for the Director of Operational Test and Evaluation, Jack Krings. His office has been briefed on all the test results and he is paying close attention to this, and will, with me, recommend to the Secretary what the DoD position should be on BIGEYE.

In conclusion, I would urge that the Congress finish what it started last year. That we tie up the loose strings on production in particular, and that we fully fund the defensive and destruction parts of the chemical program.

I should point out that I am with Deputy Under Secretary Hoeber this morning and with Admiral Jim Flatley, who will respond to detailed questions on the BIGEYE bomb. Ms. Hoeber is prepared, together with Colonel George Carruth of the Army, to discuss the demilitarization program as well as production of the 155mm binary artillery projectile.

We would be pleased to respond to your questions or remarks.

[The statement of Dr. Welch follows:]

## STATEMENT BY THE
## DEPUTY ASSISTANT TO THE SECRETARY OF DEFENSE (ATOMIC ENERGY)(CHEMICAL MATTERS)

LAST YEAR, SHORTLY AFTER ASSUMING MY POSITION, I ASKED YOU TO HELP PREVENT THE USE OF CHEMICAL WEAPONS AGAINST THE MEN AND WOMEN OF OUR ARMED FORCES.

TO ACHIEVE THAT GOAL, WE ASKED FOR YOUR HELP IN ARMS CONTROL; HELP THAT WOULD PRODUCE A VERIFIABLE TREATY PROHIBITING EVEN THE POSSESSION OF CHEMICAL WEAPONS.

WE ASKED FOR YOUR HELP IN STRENGTHENING THE NATO ALLIANCE AND IN RAISING THE NUCLEAR THRESHOLD.

WE ASKED YOU TO ASSIST US IN ELIMINATING THE SAFETY CONCERNS ASSOCIATED WITH THE LETHAL CHEMICAL MUNITIONS NOW STORED IN OUR COUNTRY.

IN ALL THESE AREAS, THE CONGRESS TOOK THE FIRST IMPORTANT STEP THAT CONTRIBUTED TO ALL OF THESE CRITICAL NATIONAL SECURITY OBJECTIVES. I WOULD LIKE TO THANK YOU FOR TAKING THAT FIRST STEP. TODAY, WE ARE HERE TO DISCUSS THE NEXT STEP. WE WILL DISCUSS HOW YOU CAN FINISH WHAT YOU BEGAN LAST YEAR AND HOW YOU CAN HELP WITH THE REMAINING TASKS.

IN MOVING TO RESTORE THE ADEQUACY OF OUR CHEMICAL DETERRENT, THE CONGRESS HAS FIRMLY SIGNALED U.S. RESOLVE TO INSURE THAT CHEMICAL WEAPONS ARE NEVER USED AGAINST THE MEN AND WOMEN OF OUR ARMED FORCES.

THAT SIGNAL IS REFLECTED IN THE STATUS OF OUR EFFORTS TO ACHIEVE AN EFFECTIVE, VERIFIABLE BAN ON CHEMICAL WEAPONS.

WE HAVE PURSUED CHEMICAL ARMS CONTROL FOR MORE THAN TEN YEARS. FROM 1976 UNTIL 1980 THE U.S. AND USSR HELD BILATERAL TALKS AIMED AT WORKING OUT A JOINT INITIATIVE FOR BANNING CHEMICAL WEAPONS. IN 1980, THE U.S. SHIFTED ITS EFFORTS TO THE CONFERENCE ON DISARMAMENT IN GENEVA, THE UNITED NATIONS MULTILATERAL FORUM FOR ARMS CONTROL AND DISARMAMENT ISSUES. IN APRIL 1984, VICE PRESIDENT BUSH TABLED A U.S. DRAFT TREATY FOR A COMPREHENSIVE BAN ON CHEMICAL WEAPONS, BUT THE SOVIET UNION HAS YET TO RESPOND SERIOUSLY TO THAT DRAFT.

U.S. RESTRAINT IN THE CHEMICAL WEAPONS AREA HAS NOT ELICITED A CORRESPONDING RESTRAINT FROM THE SOVIETS NOR HAS IT HAD ANY SALUTARY EFFECT ON ARMS CONTROL NEGOTIATIONS. THE EFFECT HAS BEEN QUITE THE OPPOSITE. THE SOVIETS, SEEING THEIR CHEMICAL SUPERIORITY VIS-A-VIS THE U.S. AND NATO INCREASE EACH YEAR, APPARENTLY HAVE FOUND LITTLE INCENTIVE TO NEGOTIATE ON THE EXTENSIVE AND FAR REACHING VERIFICATION MEASURES A COMPREHENSIVE BAN WOULD REQUIRE.

BUT NOW WE SEE THAT YOUR ACTION TO FUND THE MODERNIZATION PROGRAM COINCIDES WITH SOME SIGNS OF MOVEMENT ON THE PART OF THE SOVIET UNION. SOVIET STATEMENTS THROUGHOUT MUCH OF 1985 ARGUED THAT APPROVAL OF U.S. BINARY MODERNIZATION WOULD UNDERMINE CHEMICAL WEAPONS ARMS CONTROL EFFORTS. HOWEVER, ONCE IT BECAME CLEAR THAT U.S. FUNDING HAD BEEN APPROVED, THE SOVIETS SHOWED A NOTICEABLY GREATER INTEREST IN THOSE EFFORTS, RETURNING TO THE TABLE FOR INFORMAL SESSIONS IN OCTOBER AND JANUARY AND, AS AGREED AT THE SUMMIT, FOR ACCELERATED U.S.-USSR BILATERALS IN JANUARY 1986. WE CANNOT SAY UNEQUIVOCALLY THAT OUR CHEMICAL MODERNIZATION PROGRAM WILL PROVIDE SUFFICIENT INCENTIVE FOR THE SOVIET UNION TO ACCEPT AN EFFECTIVE, VERIFIABLE BAN. BUT THERE IS NO DOUBT THAT CONTINUED CONGRESSIONAL RESOLVE TOWARD RESTORING AN EFFECTIVE U.S. CHEMICAL DETERRENT WILL PROVIDE OUR NEGOTIATORS WITH THE NECESSARY LEVERAGE DEFINITIVELY TO TEST SOVIET INTENTIONS.

IN ACTING TO APPROVE BINARY MODERNIZATION, YOU HAVE ALSO STRENGTHENED THE NATO ALLIANCE. WE ARE NOW WORKING WITH OUR ALLIES WITH A VIEW TO FULFILLING THE VARIOUS CONDITIONS OF THE LEGISLATION THAT RELATE TO NATO. THIS EFFORT IS CURRENTLY UNDERWAY, AND IT IS MOST IMPORTANT THAT THE EFFORT RUN ITS COURSE THROUGH THE LONG ESTABLISHED NATO CHANNELS OF COMMUNICATION WHICH HAVE PROVEN EFFECTIVE IN DEALING WITH COMMON ALLIANCE DEFENSE ISSUES. WE MUST TRY TO AVOID A POLITICIZED DEBATE IN EUROPEAN PARLIAMENTS AND ELSEWHERE WHICH WOULD DETRACT FROM THE CLEAR INCENTIVE FOR PROGRESS IN ARMS CONTROL WHICH WE ARE NOW ABLE TO PRESENT THE SOVIETS. THE U.S. MODERNIZATION EFFORT IS A SIGNIFICANT FIRST STEP TOWARD ESTABLISHING A CREDIBLE NATO DETERRENT. THE CONTINUING PROGRESS TOWARD THAT END MAKES FAR LESS LIKELY A RESORT TO NUCLEAR WEAPONS IN RESPONSE TO A WARSAW PACT CHEMICAL OFFENSIVE. THIS IS CLEARLY CONSISTENT WITH ALL OTHER NATO ACTIONS TO PUSH BACK AS FAR AS POSSIBLE THE TIME WHEN A DECISION TO USE NUCLEAR WEAPONS WOULD HAVE TO BE MADE.

I SHOULD ALSO POINT OUT THAT THE CHEMICAL WARFARE THREAT IS NOT ONLY TO NATO AND INVOLVES MORE THAN SOVIET USE AND CAPABILITIES. THE IRANIAN CHEMICAL WARFARE CASUALTIES DISPLAYED IN LONDON, STOCKHOLM AND ELSEWHERE ARE STARK REMINDERS OF THE PROBLEM OF THE DANGEROUS SPREAD OF CHEMICAL WEAPONS. THE TIME MAY COME WHEN U.S. FORCES EMPLOYED ANYWHERE IN THE WORLD COULD FACE USE OF LETHAL CHEMICALS BY AN ADVERSARY. WE MUST NEVER ALLOW OUR YOUNG AMERICAN SERVICEMEN AND WOMEN TO STAND IN THE PLACE OF THOSE TRAGIC FIGURES FROM IRAN WHO ARE NOW SO STARKLY REMINDING US OF THE REALITY OF MODERN CHEMICAL WAR.

FINALLY, YOUR ACTION HAS BROUGHT INTO VIEW THAT DAY WHEN NO LETHAL CHEMICAL WARFARE AGENTS WILL BE STORED IN U.S. DEPOTS ANYWHERE. OUR PLAN FOR DESTRUCTION BY 1994 OF THE ENTIRE UNITARY STOCKPILE IN CONJUNCTION WITH ACQUISITION OF AN ADEQUATE BINARY STOCKPILE WAS SUBMITTED TO THE CONGRESS LAST MONTH. THE DIRECT LINK BETWEEN DESTRUCTION OF THE UNITARY STOCKS AND THE PRODUCTION OF SAFE, MORE EFFECTIVE BINARY MUNITIONS UNDERSCORES OUR INTENT TO MAINTAIN THE SMALLEST, SAFEST STOCKPILE THAT DENIES A SIGNIFICANT MILITARY ADVANTAGE TO ANY INITIATOR OF CHEMICAL WARFARE. THE ENVIRONMENTAL IMPACT STATEMENT FOR THE OVERALL EFFORT IS BEING PREPARED AND IS EXPECTED TO BE FILED THIS SUMMER. A DECISION ON THE PARTICULAR DESTRUCTION OPTION TO BE USED WILL FOLLOW IN JANUARY OF 1987. THE DESTRUCTION OF THE ALREADY UNUSABLE 90 PERCENT OF THE UNITARY STOCKPILE IS THEN A MATTER OF EXECUTING THE PROGRAM TO ITS COMPLETION IN 1994. WITH ACQUISITION OF AN ADEQUATE NUMBER OF BINARY MUNITIONS TO PROVIDE A CREDIBLE DETERRENT, THE REMAINING 10 PERCENT OF THE LETHAL UNITARY STOCKPILE CAN BE DESTROYED CONCURRENTLY. THE INITIAL STEP HAS BEEN TAKEN. THE DESTRUCTION EFFORT AND THE MODERNIZATION EFFORT ARE INTIMATELY LINKED. IT IS ESSENTIAL THAT THEY BE JOINTLY SUPPORTED BY THE CONGRESS TO INSURE THAT THOSE THOUSANDS OF TONS OF LETHAL CHEMICAL AGENTS SITTING IN DEPOTS IN ALL PARTS OF THE COUNTRY CAN BE DESTROYED.

CLEARLY, LAST YEAR'S ACTION BY THE CONGRESS WAS A MAJOR STEP IN THE DIRECTION OF WHAT MUST BE OUR ULTIMATE GOAL: THE PREVENTION OF CHEMICAL WARFARE. WE NOW ASK YOU TO FOLLOW THROUGH ON THESE EFFORTS. THE TRENDS--TOWARD A STRONGER NATO ALLIANCE, TOWARD A HIGHER NUCLEAR THRESHOLD, TOWARD ELIMINATION OF LETHAL CHEMICAL AGENTS FROM STORAGE SITES--ALL OF WHICH ENCOURAGE PROGRESS IN ARMS CONTROL--MUST BE CONTINUED. TWO MONTHS AGO, THE SECRETARY OF DEFENSE ADDRESSED THE IMPORTANCE OF FOLLOW-THROUGH IN HIS FY 87 ANNUAL REPORT TO THE CONGRESS. HE SAID:

> "OUR REBUILDING OF AMERICAN MILITARY STRENGTH IS REDEFINING THE TERMS OF THE U.S.-SOVIET RELATIONSHIP. RATHER THAN DEALING FROM WEAKNESS (AND THE PROSPECT OF GREATER RELATIVE DISADVANTAGE), THE UNITED STATES IS NOW BEGINNING TO DEAL FROM STRENGTH AND THE PROMISE OF GREATER RELATIVE STRENGTH. WE MUST PERSUADE THE SOVIETS THAT THIS IS NOT A SHORT-TERM COMMITMENT. NOTHING COULD SO ENHANCE THE PROSPECTS FOR LONG-TERM PEACE AS SOVIET ACCEPTANCE OF THE PROPOSITION THAT THEY CAN ACHIEVE NO SIGNIFICANT EXPLOITABLE MILITARY ADVANTAGE OVER US."

THIS CONCLUSION ABOUT OUR OVERALL DEFENSE EFFORT IS NO LESS APPLICABLE TO OUR CHEMICAL DETERRENCE PROGRAM. IT IS IMPORTANT, PERHAPS MORE SO THAN EVER BEFORE, IMPORTANT THAT WE FOLLOW THROUGH WITH WHAT WE HAVE BEGUN TO INSURE THESE OUTCOMES THAT WE ALL DESIRE. THE PROGRAM WE HAVE DEVELOPED FOR FY 87 CONTINUES THE THEMES OF THE PREVIOUS YEAR AND BUILDS ON OUR ACCOMPLISHMENTS TO DATE. IT IS A COMPREHENSIVE AND WELL THOUGHT OUT EFFORT WHICH SEEKS TO ACHIEVE THE MAXIMUM NATIONAL SECURITY RETURN ON THE INVESTMENT MADE.

OUR PROGRAM SEEKS TO PREVENT CHEMICAL WARFARE THROUGH THREE MUTUALLY SUPPORTING ELEMENTS. WE WILL CONTINUE TO SEEK A COMPREHENSIVE, VERIFIABLE BAN ON CHEMICAL WEAPONS. WE WILL MAINTAIN A STRONG DEFENSIVE POSTURE BY PROVIDING THE BEST AVAILABLE DEFENSIVE EQUIPMENT AND SYSTEMS TO OUR SERVICE PERSONNEL. AND, WE WILL DEVELOP A CHEMICAL RETALIATORY CAPABILITY SUFFICIENT TO DETER USE OF CHEMICALS AGAINST US BY PROVIDING AN ABILITY TO NEGATE ANY ADVANTAGE AN ADVERSARY MIGHT PERCEIVE IN INITIATING CHEMICAL WARFARE.

MOREOVER, TO THE EXTENT THAT THEY MAKE CHEMICAL WAR LESS ATTRACTIVE AS A MEANS OF GAINING A MILITARY ADVANTAGE, THE DEFENSIVE AND RETALIATORY COMPONENTS OF OUR PROGRAM DIRECTLY PROMOTE OUR ARMS CONTROL EFFORT. FOR NATIONS TO ACCEPT A TREATY, IT MUST CLEARLY SUPPORT THEIR NATIONAL SECURITY INTERESTS. SUCH ACCEPTANCE BY THE SOVIET UNION WOULD SEEM UNLIKELY SO LONG AS A MAJOR ADVANTAGE APPEARS ACHIEVABLE THROUGH THEIR USE OF CHEMICAL WEAPONS.

OUR PROGRAM CONTINUES EFFORT IN THE AREAS OF DEFENSIVE MEASURES, RETALIATORY CAPABILITIES AND DESTRUCTION IN ABOUT THE SAME PROPORTION AS IN PREVIOUS YEARS.

EVEN THOUGH MOST OF THE DISCUSSION HAS FOCUSED ON OUR CHEMICAL RETALIATORY CAPABILITY, ALMOST THREE QUARTERS OF OUR FY 87 PROPOSED BUDGET IS FOR EQUIPMENT TO HELP OUR FORCES DEFEND AGAINST A CHEMICAL ATTACK. THAT EQUIPMENT CONSISTS OF MASKS, BOOTS, GLOVES, CLOTHING, DETECTORS, DECONTAMINATION SYSTEMS, AND SHELTERS NOT ONLY TO KEEP OUR TROOPS ALIVE, BUT ALSO TO ENABLE THEM TO CONTINUE TO OPERATE UNDER CHEMICAL ATTACK CONDITIONS.

A STRONG CHEMICAL DEFENSIVE POSTURE IS ESSENTIAL TO CHEMICAL DETERRENCE EVEN IN THE PRESENCE OF A SATISFACTORY RETALIATORY CAPABILITY. TO PROTECT OUR SOLDIERS FROM AN INITIAL STRIKE AND TO INSURE WE ARE NO MORE VULNERABLE TO ATTACK THAN OUR POTENTIAL ADVERSARIES, WE MUST CONTINUE TO IMPROVE OUR ABILITY TO SURVIVE AND SUSTAIN OPERATIONS IN THE CHEMICAL WARFARE ENVIRONMENT. WITH YOUR ASSISTANCE, WE HAVE MADE SIGNIFICANT PROGRESS IN THIS AREA AND WE SOLICIT YOUR CONTINUED SUPPORT.

THE FY 87 BUDGET FOR CHEMICAL DEFENSE IS $815 MILLION. WE ARE MAKING SIGNIFICANT STRIDES IN PROCURING IMPROVED PROTECTIVE MASKS, CHEMICAL DETECTORS, PROTECTIVE SHELTERS, AND DECONTAMINATION SYSTEMS THAT WILL INCREASE OUR ABILITY TO SURVIVE AND OPERATE IN A CHEMICAL ENVIRONMENT. OUR GROWING CONCERN IS THAT THE SOVIET UNION HAS MANAGED TO PRODUCE SOME NOVEL AND UNKNOWN AGENTS AGAINST WHICH OUR EXISTING DEFENSIVE EQUIPMENT WOULD BE INEFFECTIVE. ACCORDINGLY, WE DEVOTE PART OF OUR RESEARCH AND DEVELOPMENT BUDGET TO LOOKING FOR WAYS TO PROTECT AGAINST THESE UNKNOWNS. WE FURTHER RECOGNIZE THAT THE NUMBER OF UNKNOWNS COULD BE VERY LARGE AND THAT WE MUST THEREFORE TAILOR DEVELOPMENT PROGRAMS TO ADDRESS UNIVERSAL THREATS RATHER THAN SPECIFIC ONES.

WE WILL NOT ACCEPT DUPLICATION AMONG THE VARIOUS SERVICES REGARDING CHEMICAL DEFENSE DEVELOPMENTS. THE JOINT SERVICE AGREEMENT FOR CHEMICAL WARFARE AND CHEMICAL/BIOLOGICAL DEFENSE WAS SIGNED BY THE SERVICES SECRETARIES RESPONSIBLE FOR RESEARCH, DEVELOPMENT AND ACQUISITION IN JULY 1984. THE AGREEMENT ENSURES THAT THE SERVICES CONDUCT COORDINATED PROGRAMS TO MEET, WITHIN THE CONSTRAINTS OF RESOURCES AVAILABLE, THE HIGHEST PRIORITY REQUIREMENTS OF ALL THE SERVICES. THE JOINT SERVICE AGREEMENT IS WORKING. OVER FORTY EFFORTS THAT WERE CLEARLY REDUNDANT AMONG THE SERVICES HAVE BEEN ELIMINATED AND WE ARE CONTINUING TO SCRUTINIZE THE DEFENSIVE PROGRAM FOR OTHER REPETITIVE EFFORTS. THIS IS A SUCCESS STORY WHICH WILL ONLY GET BETTER.

THE ARMY REMAINS THE DESIGNATED LEAD SERVICE IN CHEMICAL DEFENSE RESEARCH AND DEVELOPMENT. THEIR FY 87 BUDGET REQUEST IS FOR A TOTAL OF $337 MILLION. ABOUT HALF THIS AMOUNT, $161 MILLION IS FOR RESEARCH AND DEVELOPMENT OF EQUIPMENT, MUCH OF WHICH HAS JOINT SERVICE APPLICATIONS.

THE GOAL OF ARMY RESEARCH AND DEVELOPMENT IN DETECTION, PROTECTION, AND DECONTAMINATION MATERIEL, IS TO TAKE ADVANTAGE OF ADVANCED TECHNOLOGY TO DEVELOP EQUIPMENT WHICH IS SMALLER AND EASIER TO OPERATE, BUT WITH GREATER OPERATIONAL CAPABILITY. WE MUST CONTINUALLY LOOK FOR WAYS TO REDUCE THE BURDEN TO THE INDIVIDUAL AND UNIT. EXAMPLES OF THE PROGRAMS BEING PURSUED INCLUDE PREPLANNED PRODUCT IMPROVEMENTS ON THE PROTECTIVE MASKS; DEVELOPMENT OF EQUIPMENT TO PROVIDE SOLDIERS A CONTAMINATION-FREE ENVIRONMENT CRITICAL FOR SURVIVABILITY ON THE NBC BATTLEFIELD; BIOLOGICAL AND TOXIN DETECTORS RESEARCH; STANDOFF DETECTORS THAT WILL SEE THE GAS CLOUD AND WARN OUR SOLDIERS BEFORE IT REACHES THEM; AND MORE EFFECTIVE, LESS LOGISTICALLY BURDENSOME DECONTAMINATION EQUIPMENT. THE ARMY IS ALSO EXPLORING METHODS FOR NETWORKING DETECTION DEVICES TOGETHER IN ORDER TO PROVIDE AIRFIELD AND OTHER FIXED SITE AND AREA COVERAGE.

OF THE ARMY RESEARCH PROGRAM, $154 MILLION IS FOR MEDICAL DEFENSE AGAINST CHEMICAL AND BIOLOGICAL ATTACK. THE ARMY CONTINUES RESEARCH ON PROVIDING AGENT VACCINES, PRETREATMENTS AND ANTIDOTES FOR KNOWN AND SUSPECTED NEW AGENTS. PATIENT DECONTAMINATION, TREATMENT, AND SUPPORT SYSTEMS ARE ALSO INCLUDED IN THIS EFFORT.

IN FY 87, THE ARMY WILL CONTINUE PROCUREMENT OF A LIGHTWEIGHT DECONTAMINATION SYSTEM, A NEW PROTECTIVE MASK, AND SIMPLIFIED COLLECTIVE PROTECTION EQUIPMENT. THE LATTER IS ESSENTIALLY A BAG INFLATED INSIDE AN EXISTING ROOM TO PROVIDE IT WITH FILTERED AIR FOR CHEMICAL PROTECTION. FY 87

CONTINUES PROCUREMENT OF EXISTING PROTECTIVE CLOTHING AND EQUIPMENT FOR TRAINING AND EXERCISES, AS WELL AS FOR U.S. DIRECT HIRE HOST NATION PERSONNEL AND FOR WAR RESERVES. WITH YOUR SUPPORT, THE ARMY HAS BUILT UP ITS WAR RESERVE OF PROTECTIVE CLOTHING OVER THE YEARS, AND IS NOW IN A POSITION TO REDUCE ITS REQUEST IN THIS AREA FROM THE FY 86 AMOUNT OF $91 MILLION TO $26 MILLION IN FY 87. WITH THE INCLUSION OF OPERATIONS AND MAINTENANCE (O&M) FUNDS, THE ARMY'S TOTAL REQUEST FOR ALL OF THESE PURCHASES IS $182.8 MILLION.

WE ALSO REQUEST $35 MILLION FOR THE UPGRADE OF THE CHEMICAL TEST FACILITIES AT DUGWAY PROVING GROUND. THIS INCLUDES INSTRUMENTATION IMPROVEMENTS, PROFESSIONAL AND SUPPORT PERSONNEL, AND MILITARY CONSTRUCTION TO REPLACE AN INADEQUATE AND OBSOLETE TEST CHAMBER. THIS IS AN EXTREMELY IMPORTANT EFFORT NOT ONLY BECAUSE IT PROVIDES A MEANS OF TESTING NEWLY DEVELOPED EQUIPMENT BUT ALSO BECAUSE IT PROVIDES THE MEANS FOR MORE REALISTICALLY DEFINING THE IMPACT OF CHEMICAL WEAPONS ON THE BATTLEFIELD. WITH A BETTER UNDERSTANDING OF HOW CHEMICAL AGENTS AFFECT TACTICAL OPERATIONS, COMMAND AND CONTROL WE CAN BETTER DEFINE THE PARAMETERS FOR RISK ASSESSMENT AND MOVE TOWARD AN INNOVATIVE APPROACH TO CHEMICAL DEFENSE. TO THE DEGREE THAT THESE EFFORTS REDUCE THE DEGRADATION IMPOSED BY ENEMY CHEMICAL AGENTS, THEY WILL REDUCE THE POTENTIAL ADVANTAGE TO BE GAINED THROUGH THEIR EMPLOYMENT AND, THUS, THE LIKELIHOOD OF THEIR FIRST USE.

TURNING TO THE CHEMICAL DEFENSIVE PROGRAM FOR THE NAVY AND MARINE CORPS, THEIR REQUEST FOR CHEMICAL DEFENSE-RELATED RESEARCH AND DEVELOPMENT FOR SYSTEMS UNIQUE TO NAVAL AND AMPHIBIOUS OPERATIONS TOTALS $12.9 MILLION. EFFORTS FOCUS ON BOTH SHIPBOARD AND SHORE BASED DETECTION AND WARNING SYSTEMS.

PROCUREMENT AND O&M FUNDING FOR NAVY AND MARINE CORPS CHEMICAL DEFENSE EQUIPMENT TOTALS $55.8 MILLION. THESE FUNDS CONTINUE ACQUISITION OF INDIVIDUAL PROTECTIVE EQUIPMENT FOR SHORE AND SHIPBOARD PERSONNEL. DETECTORS FOR OVERSEAS LOCATIONS AND SHIPBOARD APPLICATIONS ARE INCLUDED. THE MARINES WILL ALSO BE PROCURING SOME DECONTAMINATION SYSTEMS THIS YEAR.

IN FY 87, THE AIR FORCE IS REQUESTING $44.7 MILLION TO PURSUE AIR FORCE UNIQUE RESEARCH AND DEVELOPMENT ACTIVITIES AS WELL AS THOSE LEVIED UNDER THE TERMS OF THE JOINT SERVICE AGREEMENT SUCH AS AIRCREW PROTECTION AND FIXED SITE COLLECTIVE PROTECTION. OF THIS AMOUNT, $13.4 MILLION WILL GO TOWARD MEDICAL CHEMICAL DEFENSE NEEDS ASSOCIATED WITH AEROMEDICAL CASUALTY HANDLING, TREATMENT, AND TRANSPORT; DETECTION AND WARNING, AND DECONTAMINATION. A PRIMARY THRUST OF THE AIR FORCE PROGRAM IS TO COMPLETE DEVELOPMENT OF AN IMPROVED PROTECTIVE MASK SYSTEM FOR AIRCREW MEMBERS. THE SYSTEM WILL REPLACE AN ADAPTATION OF A FIREFIGHTERS SMOKE MASK AND WILL MAKE A SIGNIFICANT IMPROVEMENT IN ALLOWING AIRCREW MEMBERS TO PERFORM FLIGHT DUTIES IN A NEAR NORMAL MANNER. THE AIR FORCE ALSO EXPECTS TO MAKE A PRODUCTION DECISION ON TRANSPORTABLE COLLECTIVE PROTECTION SYSTEMS DESIGNED TO PROVIDE COLLECTIVE PROTECTION TO MOBILE, DEPLOYED FORCES.

THE AIR FORCE WILL CONTINUE PROCUREMENT OF A NEW PROTECTIVE MASK FOR GROUND SUPPORT PERSONNEL. IN ADDITION, THE AIR FORCE WILL BE INCREASING THE NUMBER OF SURVIVABLE COLLECTIVE PROTECTION SYSTEMS OVERSEAS FROM 155 TO 299. FOR RADAR CONTROL VANS AND EQUIPMENT, THE AIR FORCE WILL BEGIN PROCURING MODULAR COLLECTIVE PROTECTIVE EQUIPMENT. AIR FORCE O&M FUNDS WILL SUPPORT REPLACING PROTECTIVE ENSEMBLES AND OTHER EQUIPMENT ITEMS USED FOR TRAINING AND EXERCISES, AS WELL AS EQUIPPING OTHER UNITS WITH THEIR FULL COMPLEMENT OF REQUIRED PROTECTIVE GEAR. THE TOTAL AIR FORCE PROCUREMENT AND O&M REQUEST IS $157.6 MILLION IN FY 87.

FINALLY, THE AIR FORCE SEEKS $10.7 MILLION IN MILITARY CONSTRUCTION FUNDS TO INCORPORATE CHEMICAL COLLECTIVE PROTECTION IN CONVENTIONALLY HARDENED PILOT OPERATIONS AND AVIONICS FACILITIES.

THESE DEFENSIVE IMPROVEMENTS WHICH REPRESENT MORE THAN 70 PERCENT OF THE DoD CHEMICAL PROGRAM ARE REQUIRED REGARDLESS OF THE STATUS OF CHEMICAL ARMS CONTROL OR RETALIATORY PROGRAMS. IN KEEPING WITH OUR LONG STANDING POLICY OF NO FIRST USE OF CHEMICAL WEAPONS, WE MUST BE EVER CAPABLE OF WITHSTANDING A CHEMICAL FIRST STRIKE AND PURSUING THE COURSE OF THE BATTLE TO A FAVORABLE CONCLUSION UNDER CHEMICAL WARFARE CONDITIONS.

THE PROGRAM RELATED TO MANAGEMENT OF THE DETERRENT STOCKPILE AND RETALIATORY SYSTEMS COMPRISES THE REMAINING 30 PERCENT OF THE DoD REQUEST.

A THIRD OF THAT, ABOUT $120 MILLION, SUPPORTS THE PROGRAM FOR DESTRUCTION OF THE EXISTING UNITARY STOCKS. HOWEVER, IN KEEPING WITH THE CONGRESSIONAL MANDATE FOR A COMPREHENSIVE DESTRUCTION EFFORT WHICH WILL COMPLETELY ELIMINATE LETHAL CHEMICAL AGENT STORAGE BY 1994, WE ARE REVISING OUR DESTRUCTION EFFORT. DESTRUCTION OF THE ENTIRE UNITARY STOCKPILE ON AN ACCELERATED BASIS IS POTENTIALLY COSTLY AND WILL REQUIRE CAREFUL REVIEW TO INSURE THAT WE MAINTAIN OUR FOCUS ON SAFETY AND THE ENVIRONMENT. AS THE PLAN SUBMITTED IN MARCH CLEARLY DEMONSTRATED, THE ALTERNATIVES TO BE CONSIDERED INVOLVE DIFFICULT CHOICES WITH REGARD TO THE STORAGE SITES, THEIR SURROUNDINGS AND THE NUMEROUS LOCATIONS THAT WOULD BE AFFECTED BY TRANSPORTING THE MUNITIONS TO REGIONAL OR NATIONAL DESTRUCTION CENTERS SHOULD ONE OF THOSE OPTIONS BE CHOSEN.

WE WILL NEED YOUR ASSISTANCE IN CARRYING THIS PROGRAM THROUGH TO ITS MUCH DESIRED CONCLUSION. THIS YEAR'S REQUEST DOES NOT REFLECT THE MAJOR RESOURCE IMPACT OF THE NATIONAL DESTRUCTION PROGRAM. WE EXPECT THE ULTIMATE COST OF THIS DESTRUCTION EFFORT TO BE ABOUT $1.7 BILLION OVER THE SEVERAL YEARS OF CONSTRUCTION AND OPERATIONS LEADING TO COMPLETION IN 1994. WITH THE CHOICE OF DISPOSAL OPTION AS YET UNMADE AND NECESSARILY DEPENDENT ON COMPLETION OF THE ENVIRONMENTAL DOCUMENTATION, WE CANNOT YET PRECISELY IDENTIFY THE FRONT END INVESTMENT REQUIRED TO INSURE WITH CONFIDENCE THE ATTAINMENT OF THE 1994 COMPLETION DATE. NEVERTHELESS, WE ANTICIPATE THAT INITIAL PROCUREMENTS IN THE FIRST YEAR OR TWO OF THE EFFORT MAY WELL APPROACH ONE THIRD OF THE TOTAL PROGRAM REQUIREMENT. THAT LEVEL OF EXPENDITURE WILL CLEARLY MAKE A DIFFERENCE IN THE DISTRIBUTION OF PROGRAM RESOURCES, AND WE WILL NEED YOUR HELP TO INSURE THE COURSE OF THE REMAINDER OF OUR PROGRAM STAYS ON TRACK.

RECOGNIZING THE SIZE OF THIS EFFORT, WE ARE CONTINUING OUR SEARCH FOR NEW TECHNOLOGIES WHICH WILL REDUCE COSTS AND SIMPLIFY OPERATIONS WHILE MAINTAINING THE HIGH LEVELS OF SAFETY AND SECURITY WE HAVE ACHIEVED OVER THE HISTORY OF THE DESTRUCTION PROGRAM. APPROXIMATELY $10 MILLION IN RDT&E FUNDS WILL SUPPORT OUR ADVANCED TECHNOLOGY EFFORT. THE EFFORT INCLUDES CRYOFRACTURE TECHNIQUES FOR CHEMICAL MUNITIONS, CIRCULATING BED COMBUSTOR FURNACE TECHNOLOGY FOR BULK CHEMICAL AGENTS, ROBOTICS APPLICATIONS AND IMPROVED MONITORING EQUIPMENT.

ABOUT $50 MILLION IS REQUIRED TO PURCHASE EQUIPMENT FOR TESTING AT THE CHEMICAL AGENT MUNITIONS DISPOSAL SYSTEM AT THE JOHNSTON ATOLL SITE AND THE TOOELE ARMY DEPOT DISPOSAL FACILITY IN UTAH. A PORTION IS ALSO FOR TESTING AT THE CHEMICAL AGENT MUNITIONS DISPOSAL SYSTEM AT TOOELE. $60 MILLION IN OPERATION AND MAINTENANCE FUNDS WILL BE REQUIRED TO CONTINUE TESTING, OPERATIONS, TECHNICAL SUPPORT AND MANAGEMENT FOR THE DESTRUCTION PROGRAM.

AS DIRECTED IN LAST YEAR'S LEGISLATION, ALL FUNDS EXCEPT MILITARY CONSTRUCTION HAVE BEEN TRANSFERRED TO AN OSD FUNDING LINE. THE ARMY AS DoD'S EXECUTIVE AGENT FOR STOCKPILE DESTRUCTION WILL CONTINUE TO EXECUTE THE PROGRAM.

THE RETALIATORY PROGRAM FOR FY 87 CONTINUES WITH THE SYSTEMS APPROVED LAST YEAR--THE 155MM BINARY CHEMICAL ARTILLERY PROJECTILE AND THE BIGEYE BINARY CHEMICAL BOMB. RESEARCH AND DEVELOPMENT ON THE BINARY CHEMICAL WARHEAD FOR THE MULTIPLE LAUNCH ROCKET SYSTEM, THE THIRD COMPONENT OF OUR BINARY CHEMICAL DETERRENT CONTINUES. ADDITIONAL RESEARCH AND DEVELOPMENT IS APPLIED TO THE SEARCH FOR NOVEL LETHAL AND INCAPACITATING CHEMICAL AGENTS AS WELL AS FOR FOLLOW ON DELIVERY SYSTEMS WITH DESIRABLE INCREASED RANGE OR STAND-OFF CAPABILITIES. THE TOTAL REQUEST FOR THE RETALIATORY PART OF THE PROGRAM IS $200 MILLION OR ABOUT 18 PERCENT OF THE TOTAL.

ABOUT $158 MILLION OF THAT AMOUNT CONTINUES THE 155MM PROJECTILES AND BIGEYE BOMB PROGRAMS. AS I MENTIONED EARLIER, WE HAVE INITIATED THE WORK REQUIRED TO SATISFY THE CONDITIONS IMPOSED LAST YEAR ON FUNDING FOR PRODUCTION OF THE 155MM PROJECTILE AND PROCUREMENT OF FACILITIES FOR THE BIGEYE BOMB. THAT EFFORT IS PROCEEDING WELL AND I BELIEVE WE WILL BE IN A POSITION TO EXECUTE THESE PROGRAMS BY THIS SUMMER. THAT IS CONSISTENT WITH OUR PROJECTED SCHEDULES FOR ACQUISITION OF THESE SYSTEMS AND SUPPORTS OUR OVERALL ACQUISITION STRATEGY.

THE ARMY IS REQUESTING $86.3 MILLION TO CONTINUE PROCUREMENT OF THE 155MM, GB-2, BINARY CHEMICAL PROJECTILE. THESE FUNDS PROVIDE THE SECOND YEAR OF PRODUCTION OF THIS SYSTEM AND A FACILITY FOR PRODUCTION OF THE REAGENT DC

WHICH WILL BE USED TO PRODUCE THE BINARY COMPONENT DF FOR THE SECOND AND SUBSEQUENT YEARS OF PRODUCTION. THEY ALSO EXPAND THE METAL PARTS FACILITY AT LOUISIANA ARMY AMMUNITION PLANT TO SUPPORT THE OPTIMUM PRODUCTION RATE FOR THE 155MM BINARY PROJECTILE. GIVEN THAT ALL CONDITIONS ON PRODUCTION FUNDS ARE SATISFIED BY JULY 1986, WE EXPECT TO BE ABLE TO PRODUCE THE FIRST COMPLETE 155MM BINARY PROJECTILE IN DECEMBER OF 1987.

WE ARE PROCEEDING WITH OPERATIONAL TESTING OF THE BIGEYE BOMB. DUE TO THE CONGRESS' CONCERN OVER ITS TECHNICAL PERFORMANCE, PRODUCTION FUNDS FOR BIGEYE WERE NOT APPROVED LAST YEAR. HOWEVER, YOUR ACTION IN APPROVING FUNDS FOR FACILITIES FOR BIGEYE REFLECTS A DEGREE OF CONFIDENCE IN OUR ABILITY TO SOLVE THE REMAINING TECHNICAL PROBLEMS AND MOVE ON TO PRODUCTION OF THIS VITAL LONG RANGE PERSISTENT CHEMICAL DETERRENT SYSTEM.

THE NAVY AND AIR FORCE HAVE COMPLETED THE FIRST PHASE OF BIGEYE OPERATIONAL TESTING. BOTH SERVICES' PRELIMINARY TEST RESULTS INDICATE THAT THE SYSTEM IS POTENTIALLY READY FOR LIMITED PRODUCTION SUBJECT TO CORRECTION OF SHORTCOMINGS IDENTIFIED DURING THE TEST PROGRAM. IT NOW APPEARS THAT CORRECTION OF THOSE ISSUES CAN BE ACCOMPLISHED TO ALLOW CONSIDERATION OF A LIMITED PRODUCTION DECISION IN JULY OF THIS YEAR AT THE EARLIEST. GIVEN A FAVORABLE DECISION, WE MUST BE IN A POSITION TO MOVE FORWARD WITH LOW RATE INITIAL PRODUCTION IN FY 1987. THE AIR FORCE AND NAVY HAVE ACCORDINGLY REQUESTED A TOTAL OF $56.9 MILLION TO SUPPORT THAT FIRST PRODUCTION INCREMENT.

IN THE MEANTIME, OBLIGATION OF THE FUNDS FOR BIGEYE FACILITIES MUST AWAIT THE COMPLETION OF THE TASKS SPECIFIED BY THE LEGISLATIVE CONSTRAINTS AND THE OUTCOME OF THE PLANNED CORRECTIVE ACTIONS. BASED ON THE ANTICIPATED SCHEDULE FOR THE LOW RATE INITIAL PRODUCTION DECISION, THERE IS SUFFICIENT TIME AVAILABLE TO BUILD THE FACILITIES IN SUPPORT OF THE CURRENTLY PLANNED SEPTEMBER 1988 INITIAL OPERATIONAL CAPABILITY.

A DEEP STRIKE WEAPON IS A CRITICALLY NEEDED DETERRENT SYSTEM AND WE ARE CONFIDENT THAT WE CAN MEET THE TECHNICAL CHALLENGES IDENTIFIED DURING THE FIRST PHASE OF BIGEYE OPERATIONAL TESTING. ON THE OTHER HAND, WE ARE REALISTICALLY ASSESSING THE PROGRESS OF THIS SYSTEM TO INSURE THAT IT ACHIEVES THE MINIMUM STANDARDS NECESSARY TO ASSURE ITS MEANINGFUL CONTRIBUTION TO DETERRENCE. THE SECRETARY OF DEFENSE WILL SHORTLY SUBMIT HIS EVALUATION OF BIGEYE PERFORMANCE TO DATE AS REQUIRED BY LAST YEAR'S LEGISLATION. THAT DEPARTMENT OF DEFENSE LEVEL REVIEW IS ONLY ONE OF MANY THAT HAVE BEEN AND WILL CONTINUE TO BE APPLIED TO MAKE SURE THAT BIGEYE MEETS THE TEST. I ASSURE YOU THAT NEITHER FACILITIES NOR PRODUCTION MONEY FOR BIGEYE WILL BE SPENT UNTIL WE ARE CERTAIN IT IS READY FOR PRODUCTION.

THE TOTAL REQUEST FOR THE BIGEYE PROGRAM IS $77.2 MILLION IN FY 87. IN ADDITION TO THE PREVIOUSLY MENTIONED PRODUCTION FUNDS, THE ARMY IS REQUESTING $15.4 MILLION FOR A SECOND SOURCE OF BIGEYE METAL PARTS. AS A RESULT OF COMPETITION FOR THAT CONTRACT, WE PROJECT SAVINGS OF UP TO TWENTY PERCENT IN TOTAL SYSTEM ACQUISITION COST. THE TOTAL ALSO INCLUDES $5.0 MILLION IN RDT&E TO CARRY THE TEST PROGRAM AND CORRECTIVE ACTIONS TO COMPLETION.

ADDITIONAL RESEARCH AND DEVELOPMENT FOR THE RETALIATORY PROGRAM REQUIRES A TOTAL OF $37.2 MILLION. THIS INCLUDES $25.3 MILLION TO CONTINUE THE PREVIOUSLY MENTIONED EFFORT ON THE BINARY WARHEAD FOR THE MULTIPLE LAUNCH ROCKET SYSTEM AND $11.9 MILLION FOR BASIC RESEARCH AND EXPLORATORY DEVELOPMENT OF FUTURE RETALIATORY SYSTEMS. IN ADDITION TO SUPPORTING FURTHER WORK ON THE EXISTING BINARY AGENTS, THE EXPLORATORY EFFORT SEEKS NOVEL LETHAL AND INCAPACITATING COMPOUNDS TO PROVIDE A DEGREE OF INSURANCE AGAINST TECHNOLOGICAL SURPRISE AND TO MAINTAIN THE CURRENCY OF OUR RETALIATORY TECHNOLOGY. THIS EFFORT IS CLOSELY LINKED TO CONTINUING WORK ON FOLLOW ON DELIVERY SYSTEMS WHICH WILL INCORPORATE GREATER RANGE, GREATER ACCURACY AND STAND OFF CAPABILITIES. THE BINARY MLRS SYSTEM IS A GOOD EXAMPLE OF BUILDING ON AN EXISTING SYSTEM; TAKING ADVANTAGE OF A FIELDED DELIVERY CAPABILITY TO EXPAND THE SCOPE OF OUR CHEMICAL DETERRENT AT THE LEAST POSSIBLE COST. A LONG RANGE MASTER PLAN FOR FUTURE DEVELOPMENT OF RETALIATORY SYSTEMS IS AMONG THE PROJECTS WHICH WILL INSURE OUR FUTURE CHEMICAL SYSTEM ARE SURVIVABLE, READILY USABLE AND AFFORDABLE.

IN SUM, OUR FY 87 CHEMICAL DETERRENCE PROGRAM REQUIRES $1.14 BILLION TO CONTINUE THESE VITAL PROGRAMS AND FOLLOW THROUGH ON OUR MUTUAL SEARCH FOR AN END TO CHEMICAL WARFARE. WE MUST BE RESOLUTE IN OUR INTENT TO KEEP THESE LETHAL CHEMICALS OFF THE BATTLEFIELD. WE MUST BE FIRM IN SUPPORTING OUR ARMS CONTROL NEGOTIATORS WITH THE ABILITY TO NEGOTIATE FROM A POSITION OF STRENGTH. AND, WE MUST INSURE THE SAFETY OF THE MEN AND WOMEN OF OUR ARMED FORCES FROM THE EFFECTS OF THESE DEVASTATING WEAPONS.

THE SOLDIERS, SAILORS, AIRMEN AND MARINES NEED YOUR HELP. THEY DO NOT WANT TO GO ONTO A BATTLEFIELD, WHETHER IN WESTERN EUROPE, THE MIDDLE EAST, OR KOREA, AND APPEAR SO WEAK AS TO INVITE CHEMICAL ATTACK. WE WANT A VERIFIABLE TREATY THAT PROHIBITS THE POSSESSION OF CHEMICAL WEAPONS. UNTIL A TREATY IS IN HAND, WE WANT TO DETER CHEMICAL WEAPON USE. DEFENSE IS NECESSARY BUT NOT SUFFICIENT; WE MUST HAVE A RETALIATORY CAPABILITY TO DETER FIRST-USE. TODAY, WE DO NOT HAVE THE NEEDED RETALIATORY CAPABILITY. WE HAVE AN OBLIGATION TO REMAIN--AND INDEED WE INTEND TO REMAIN--ON THE MORAL HIGH GROUND WITH RESPECT TO CHEMICAL WARFARE. WE MUST CONTINUE TO DO WHAT IS NECESSARY TO ENSURE THAT CHEMICAL WEAPONS ARE NEVER USED AGAINST THE MEN AND WOMEN OF OUR ARMED FORCES OR THOSE OF OUR ALLIES. IF THERE IS ANYTHING REPREHENSIBLE, ABHORRENT AND UNACCEPTABLE ABOUT CHEMICAL WARFARE, IT IS NOT DOING ALL THAT WE POSSIBLY CAN DO TO DISCOURAGE THE USE OF CHEMICAL WEAPONS AGAINST OUR PEOPLE IN THE FIELD.

## CLASSIFICATION OF THE CHEMICAL WEAPON BUDGET

Mr. **MURTHA**. The gentleman from Pennsylvania.

Mr. **McDADE**. Thank you, Mr. Chairman.

I want to welcome you in front of the committee.

Dr. Welch, funding for the procurement of binary chemical weapons is included in Procurement of Ammunition, Army; Other Procurement, Navy; and Other Procurement, Air Force.

In examining the classified P-1 document, it appears that the three services have followed three completely different approaches to classification of budget information.

The Army has classified as confidential both the quantity and dollar amount for the the GB-2 artillery projectile.

The Air Force has classified as secret the quantity of BIGEYE bomb procurement, but the dollar amount is unclassified.

The Navy has classified neither the quantity nor the dollar amount.

Can you give us any good reason why these differences exist?

Dr. **WELCH**. Yes, sir, I think I can. The starting point for classification is the protection of national security information. It is important to protect quantities of deterrent systems in particular, retaliatory systems in particular, if we are going to keep this information from potential enemies; indeed, uncertainty about the size of a chemical stockpile has proven to be a contribution to deterrence.

I appreciate your concern over the differences in the classification levels. Until now, the quantities and dollars of chemical weapon systems have been left up to the program director or the program manager. I intend to review that practice.

We support the uniform classification of these systems as I believe it is appropriate, at the secret level, and I am going to take action to assure that we get a uniform policy on this.

Mr. **McDADE**. Which will be classified—by both dollars and amounts?

Dr. **WELCH**. Yes, sir. We are concerned that once unit cost information is put out and later on someone puts out total cost, that the enemy will know.

## CHEMICAL WEAPON ARMS CONTROL NEGOTIATIONS

Mr. **McDADE**. Last year, Congress provided production-related funding for binary chemical weapons. Specifically, $21.7 million was provided for production of the GB-2 artillery projectile, and $98.3 million was provided for production facilities.

In addition, $6 million was provided for additional testing of the BIGEYE bomb.

One of the arguments in favor of proceeding with production funding was that this action would enhance our bargaining position at arms control talks in Geneva.

What changes, if any, have you seen in chemical weapon arms control talks since the Congress approved chemical weapon funding?

Dr. **WELCH**. The best response, of course, to that would be Deputy Director Emery's statement, which was accepted earlier this morning for the record. And I won't of course officially speak for ACDA, but I will relate some of the observations based on reading Mr. Emery's testimony.

First, the Soviets withdrew from any bilateral talks in the conference on disarmament in Geneva. They became silent and later expressed renewed interest.

You may recall during the Reagan-Gorbachev summit, there was a joint paragraph on the issue of chemical weapons calling for—expressing concern over proliferation or the spread of chemical weapons. This, I think, was positive.

It is premature to point to actual progress in Geneva, but certainly the Soviets are much more serious about the negotiations, as Mr. Emery has said. We believe that certainly if there is to be progress in arms control, we have got to act from a position of strength, that the Soviets have had a success story, a free ride until now, because they have achieved their national goal of enhancing their national security in the area of chemical warfare with the unilateral destruction and deterioration permitted by U.S. policy.

It is going to take strength and this means chemical weapons. We feel very positively that it is essential for progress in arms control, that we continue this buildup.

Mr. McDade. Can you enlighten us about the schedule or a plan for additional meetings, additional negotiations?

Dr. Welch. Arms control efforts are under way at this moment. They have been for a number of years in one form or another.

Mr. McDade. How often will the negotiators meet? Do you have any information about that?

Dr. Welch. They meet four times a year in Geneva. They have been discussing the issue of disarmament in all the meetings.

I would refer you to the Arms Control Disarmament Agency or Ambassador Lowitz in Geneva for the information.

Mr. McDade. If you would expand the record, flesh it out, please.

Dr. Welch. I will be pleased to do that.

[The information follows:]

Current chemical weapons arms control efforts are concentrated in the forty nation Conference on Disarmament (CD) in Geneva, a negotiating forum established by the UN. The CD meets twice a year; each session is three months long. Within the CD, the AD Hoc Committee on Chemical Weapons is responsible for conducting negotiations. It has created three separate sub-groups to deal with various technical questions (such as definitions, which chemicals are to be controlled, verification, etc.). These sub-groups meet formally once a week, but most of the work is carried out in an extensive number of informal meetings and consultations. The AD Hoc Committee on Chemical Weapons also holds a special, three week negotiating session in January.

### NEW CHEMICAL AGENTS

Mr. McDade. On page 12 you say that "our growing concern is that the Soviet Union has managed to ———.

To what sorts of agents are you referring?

Mr. Welch. ———.

Our defenses, our detectors, our masks and so on are designed to protect against the known agents. A few years ago, the Soviets in Afghanistan began to show us use of new agents, in addition to known agents. We were alarmed that they were using chemical weapons in the first place in violation of the Geneva Convention.

We also were concerned from the symptoms and other indicators of these operations were that there were new agents that we had not seen before.

The question arises, what should we do to protect ourselves against these new agents? Well, about two years ago we realigned our research and development program to begin to cope with the unknown, to cope with these new agents, and to make our detectors more universal in nature and not as specific.

Mr. McDade. What do we know about them. I am trying to get some specifics about agents they are producing which ———. What kind are they?

Dr. Welch. We have some indications as to the roads of research and development that the Soviets are pursuing. ———.

Mr. McDade. Is Afghanistan basically the evidence that there is a new agent being used?

Dr. Welch. That is one of a number.

Mr. McDade. Do we know what kind of agent is being used there?

Dr. Welch. ———.

We have indicators from ——— study of the Soviet R&D establishment, we know who some of those actors are. We know they have had a strong program to get new agents for a number of years.

Mr. McDade. But on the basis of what you are telling us, ———.

I have heard you say you have been testing for a number of years and are watching Afghanistan, but you must have some idea of what kind of symptoms they are producing.

Dr. Welch. The symptoms shown by Afghan casualties are different from any known. ———.

We are product improving detectors that are going into the field.

I should underline the fact that although we are concerned about these new agents, we should be continually concerned about the known agents. We are looking now at 16 countries with chemical weapons. Six more are probable. So there are a total of 22 known or probable countries with chemical weapons.

Most will use the classical weapons and it can be argued that the first time chemical weapons are used against U.S. forces, it will not be the Soviet Union. To that extent, that is the good news.

I have mentioned that we have realigned our research and development program to go after the new threat. The medical R&D program, which accounts for 20 percent of our defensive expenditures, is designed to produce antidotes, pre-treatments, et cetera, against the known and unknown agents, the new threats.

Finally, the things we have in the field are capable of product improvements and we have directed the Services to get started on product improvements to these systems to make them universal defensive systems.

Mr. McDade. Do you see any change in the Russian defense against chemicals—any change in what they are doing defensively?

Dr. Welch. We have seen no evidence in their defense equipment in the field that would indicate a new agent. We have, however—some intelligence indicators have indicated and have disclosed the existence of a new ———. We are trying to get more information about that.

You raise a very good point, of course. One of the first indicators of ——— would be those defensive systems and we have made that a number-one Defense Intelligence Agency priority of collection.

Mr. McDade. But no hard evidence yet?

Dr. Welch. We have ———. Added to this is the closed Soviet system, the very closed Soviet military system, and the highly closed nuclear and chemical area of the Soviets.

Mr. McDade. Well, if you have anything else you want to add for the record, do it.

I know it is a very difficult thing, as you point out, to be specific, but we have to appropriate towards a budget that requires some specificity, so if you want to amplify your remarks, please do.

Mr. Murtha. I don't think we can go on what might be or what could be. I think you have to be much more specific.

We are going to have a very difficult time justifying this particular item in the budget this year because of the problems we have in priorities in Gramm-Rudman-Hollings, which the President supports so strongly, and something is going to have to be cut out.

I didn't vote for Gramm-Rudman-Hollings, but it is certainly not going to help defensively. Anything you could do to give us more evidence to perhaps fund this particular item would help.

Mr. Murtha. The gentleman from Washington.

[The information follows:]

Our assessment is based on intelligence from a variety of sources. ———. In this case, the conclusion is that it is very likely that the Soviets have programs to research, develop and test new agents. The conclusion is derived from evidence that (1) the Soviets have an active chemical warfare program that continues to expand, (2) substantial research and development is underway in areas of biotechnology which have direct application to chemical warfare, (3) the Soviets have sponsored the use of novel toxins in Southeast Asia, (4) chemical agents have been used in Soviet operations in Afghanistan, (5) symptoms reported from Afghanistan do not correspond to those of any known chemical agent ———.

## NATO Force Goal

Mr. Dicks. What is the status, Dr. Welch, of the requirement included in the fiscal year 1986 Appropriations Act to secure approval of a NATO force objective before funds on chemical weapons can be spent?

Dr. Welch. I would respond, Congressman, with the remarks of Ambassador Abshire who is responsible for seeing to this matter. He has said that NATO consideration of the force goal requiring the U.S. binary production is under way.

He points out that on February 13, NATO's military committee approved the package of force proposals, including the SACEUR chemical weapons force proposal for the United States.

The DRC must now examine the military committee proposal package for each nation——

Mr. Dicks. You said the DRC?

Dr. Welch. The Defense Review Committee. It has taken the NATO force proposal package from the NATO military committee, which has approved it.

Mr. Dicks. What else has to be done?

Dr. WELCH. It will then, after DRC approval, it will be forwarded to the NATO permanent representatives for consideration. This next step in NATO's consideration of the draft force goal asks that the permanent representatives meeting at the Defense Planning Committee or DPC adopt the draft force goal.

Defense Ministers meeting at the DPC in ministerial session next month will be asked to note the permanent representatives action and adoption by the DPC permanent representatives, and noting by the Defense Ministers completes the action on the force goal.

Mr. DICKS. So the bottom line is we may have the required NATO action by May of 1986?

Dr. WELCH. Yes, sir.

Mr. DICKS. Do you anticipate any problems? This was a major concern last year in the debate over this issue. Do you anticipate any problems?

Dr. WELCH. Ambassador Abshire does not anticipate any problems. There will be a full discussion of this within NATO as with any other force goal. There will be differing views. Ambassador Abshire is optimistic and I believe there will be no problems.

The starting point for NATO in this is their stated policy of having a NATO chemical weapons deterrent capability. They recognize in their written policies that there is a need for a retaliatory chemical weapon system capability. They realize, I think especially in the Military Committee when they reviewed what is available to satisfy that policy, that NATO does not have a chemical weapon deterrent capability.

The United States has stepped forward saying it tends to provide this capability and I think NATO recognizes this.

### CHALLENGE INSPECTIONS

Mr. DICKS. In reviewing Mr. Emery's statement, it is pretty clear to me that the U.S. position is that we want to have the ability for challenge inspections. This is a key part of our bargaining position, and that thus far the progress either in Geneva or elsewhere has been basically pretty minimal.

Would you characterize that any differently after having read Mr. Emery's statement?

Dr. WELCH. I would certainly agree with it, and I would say what has been said earlier, namely, the Soviet Union has had no incentive to negotiate. When it sits down at the bargaining table, its national goal is to secure the Soviet Union's military establishment in the chemical weapon area.

It is to enhance its national security, and they could do that a number of ways: by signing a treaty or by watching the United States unilaterally disarm itself in this area, and that is what we have been doing since 1969. So for them there has been no incentive. They see their national security interest being met by the United States' lack of chemical weapon production.

Only now with the move by the Congress to make up for this, to produce binary weapons, should we expect to see any movement on the part of the Soviets.

## STAND-OFF WEAPONS

Mr. **Dicks**. Beyond BIGEYE, what research is being done on more advanced systems for long-range delivery of chemical agents? Is this where Harpoon comes in?

Dr. **Welch**. Harpoon-like systems, stand-off systems are being considered. We have asked the Army to take the lead for all services in reviewing future retaliatory systems.

We have been spending on the order of $10 million a year for the last several years looking at new chemical agents and munition concepts. We expect now that the binary production has begun for the 155, for the multiple launch rocket system, and the BIGEYE bomb, we will be able to more seriously address future requirements. We look for the need to replace these current systems in the mid to late 1990s. We fully appreciate the congressional concern expressed lately on the need for stand-off systems over the full operational range.

We are concerned that we make use of existing delivery platform systems, those especially with guidance, special guidance packages.

We should point out that in the near term we do look for product improvements for the 155mm artillery projectile that would give it increased range; the multiple-launch rocket system will also have an increased range product improvement. It now has a range of 40 kilometers and the product improvement goal is going to be around ———. That will give us a good stand-off capability that is needed.

In addition, we are looking at a product improvement for BIGEYE ———. However, we are still at the front end of this analysis. It is a Joint Service effort. We will publish a master plan for retaliatory research and development and the plan will reflect the needs we see for the 1995 to 2000 battlefield.

## Lethal Chemical Munitions

Mr. **Dicks**. The Army is requesting $25.3 million for lethal chemical munitions, to continue advanced development of a binary chemical warhead for the MLRS. Through fiscal year 1986, a total of $49.8 million has been provided for this project.

What has been obtained to date for this $49.8 million?

Dr. **Welch**. Well, with your permission, I would defer to the Army representatives sitting here to respond to that.

Mrs. **Hoeber**. Where we are at the moment in the MLRS binary chemical warhead is that we have flown 7 rockets to test it. We have approximately 10 more rockets which will be flown during this year, during fiscal year 1986; 30 more to be flown in 1987.

The rockets flown have demonstrated the flight stability, have demonstrated the minimum, medium and maximum ranges and have demonstrated dissemination of agent using stimulants and the coverage of that agent again using stimulants.

The rockets to be flown will demonstrate a new fuse. We need a new fuse for this MLRS; no existing fuse worked at the right height, and additional dissemination trials and verification of the warhead design data.

### MLRS WARHEAD PROGRAM AND FUNDINGS

Mr. **Dicks**. The amount requested for the MLRS warhead in fiscal year 1987 is $13.2 million more than was projected last year. Why has so large an increase been budgeted?

Colonel **Carruth**. Part of that, sir, is to make up for decrements in funding of prior years to get the program back on track to achieve the fiscal year 1990 type classification date that was in the program.

Mr. **Dicks**. What do you propose to do with the fiscal year 1987 funds that is different from that which was envisioned a year ago?

Colonel **Carruth**. This is for the procurement of the additional rockets that are necessary for the flight tests that are required, sir.

Mrs. **Hoeber**. Let me point out that this is a program whose instabilities in terms of funding has contributed to the increased cost. It has been a program where Congress has not evenly provided funding over the years so it has been turned on and off to certain degrees in the past, and this contributes to more cost than was originally projected.

Mr. **Dicks**. Why don't you provide for the record a detailed description of the proposed work to be supported with the fiscal year 1987 funding and include a history of this so-called instability.

[The information follows:]

During FY 1987, refinements to the final validation phase design will continue. Development Test I (DT I) and 30 flight tests will be conducted. Efforts to finalize agent physical and chemical characterization will continue. Preproduction tests on the XM450 time-proximity fuze will be conducted. Dissemination tests will be continued over target area using rockets with matured design simulants and prototype time-proximity fuzes at mid ranges. Data compilation and analysis will continue for transitioning of the effort into full scale development. The full scale development contract scope of work will be defined. Chemical Research, Development and Engineering Center will initiate injector assembly surveillance work on 36 assemblies for stockpile data. The injector assembly fill/close and load, assemble and package equipment and facility design contract will be awarded. Extensive effort in producibility engineering and planning for production hardware will be conducted to achieve production cost goals. System will undergo tactical missions firings, as opposed to technical, to validate firing software and production interface module. This module ensures the launcher system will accommodate all warheads.

The funding history, which has created instability in the program, for the MLRS BCW is as follows:

| Fiscal year | Funds required | Funds received | Date received | Impacts |
|---|---|---|---|---|
| 1982 | $8,186 | $7,789 | On time | None |
| 1983 | 18,935 | 0 | NA | Stopped program in the second year of development |
| 1984 | 26,702 | 12,389 | 3 months late | Delayed new start of program: Milestone I delayed until Jun 84 |
| 1985 | 20,600 | 8,957 | 3 months late | Delayed conducting tests. Deferred noncritical path testing, program developmental phases had to be restructured for synchronization. Reprograming action not yet acted on (as of 9 May 86). IOC and milestones slipped |
| 1986 | 21,400 | [1] 18,950 | 4 months late | Delayed agent and fuze development effort (CRDEC/HDL were out of funds in 1QFY86). Program restructured to restore earliest IOC by adding an RDTE pilot plant, slipped validation phase contract 7 months |
|  | 95,823 | 48,085 |  | Less than 50 percent of requirement |

[1] Note.—Reduction of $2,363 thousand was applied for RDTE Army Industrial Fund.

### TOTAL COST FOR MLRS WARHEAD

Mr. **Dicks**. The Army said last year that the total cost to develop a chemical warhead for MLRS would be $129.8 million.

What is the estimate of total cost today?

Colonel **Carruth**. The current estimate is approximately $140 million, but I would like to provide the exact layout for the record.

Mr. **Dicks**. Why don't you also explain the increase beyond instability, the funding profile and then why the estimate has changed.

You can also put that in the record.

[The information follows:]

The increase in the development cost for the Multiple Launch Rocket System Binary Chemical Warhead (MLRS BCW) is due to several factors. One major factor is the instability of receiving below required funding which defers developmental tasks, slips schedules and drives up the costs. Two specific actions resulting in cost increases in the FY 1987 submission are: One, the FY 1985 Reprograming Action of $6.0 million has not yet been acted on by Congress. This required tasks to be deferred from FY 1985/1986 which are now programed for FY 1987. Second, funding delays slipped the program transition to full scale development. This caused the development schedule to be restructured in order to maintain the earliest possible date to have the system ready for production in FY 1991.

The funding profile for the MLRS BCW development is as follows:

[In thousands of dollars]

| | |
|---|---|
| Prior | 29,135 |
| Fiscal year: | |
| 1986 | 18,950 |
| 1987 | 25,307 |
| 1988 | 31,831 |
| Cost to completion | 52,557 |
| Total | 157,780 |

Mr. **Dicks**. What are the estimated total procurement quantities and costs of chemical warheads for the MLRS?

Colonel **Carruth**. I know the quantity——

Mr. **Dicks**. What is the quantity?

Colonel **Carruth**. ———.

Mr. **Dicks**. Why don't you put the cost in the record.

[The information follows:]

The procurement costs are estimated at $631.6 million.

### PRIORITY OF MLRS PROGRAM

Mr. **Dicks**. The Army has stated that an MLRS capability is needed in addition to the 155-millimeter binary projectile and the BIGEYE bomb. However, we are faced with severe and growing fiscal constraints.

It seems reasonable to inquire why those two developed capabilities, although less than the Army wants as its ideal solution, would nonetheless suffice reasonably well.

In the range of R&D items the Army wishes to pursue, of what relative priority is the MLRS chemical warhead?

Dr. **Welch**. It is a high priority and the vugraph, I think, explains—this vugraph illustrates the fact that we need a capability to cause an initiation of chemical warfare to bear the brunt of the chemical battlefield over the entire breadth and depth of that battlefield.

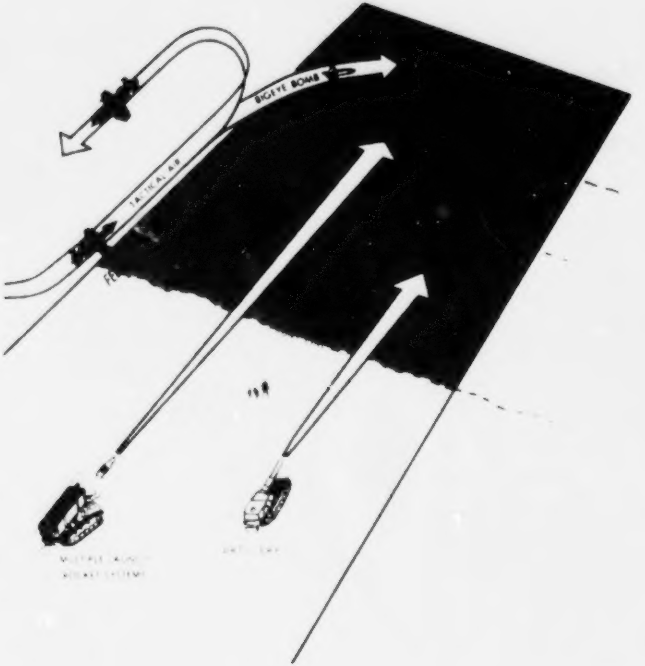
# OPERATIONAL REQUIREMENT

- FEW
- EFFECTIVE

**BIGEYE**

**MLRS**

**155mm**


BIGEYE BOMB
TACTICAL AIR
MULTIPLE LAUNCH ROCKET SYSTEMS
ARTILLERY

731

Mr. DICKS. I was a little worried; that looked like one was returning and then I realized that was an airplane.

Dr. WELCH. The returning aircraft has just dropped a BIGEYE bomb several miles deep.

Mr. DICKS. Did it work?

Dr. WELCH. It worked. It covered a third of a square mile. The casualties were high, and it was a very cost-effective system.

Now, intermediate, short of that out to the ——— product improvement range, we need the ability to put down an intermediate volatility agent and that is what the MLRS is about.

At shorter ranges, we need a different agent to be delivered by artillery and that is the nonpersistent nerve agent GB present in the 155mm artillery shell.

So we have developed a carefully conceived capability to put the right agent at the right place on the battlefield.

We need the MLRS for that intermediate capability.

Mr. DICKS. With the deterrent already provided with two systems, how much additional deterrent is provided by MLRS? How does the Army calculate that this additional deterrent is worth the additional cost?

Dr. WELCH. MLRS is essential to this deterrence picture.

Mr. DICKS. How does the Army calculate that this additional deterrent is worth the additional cost? You can speculate on that for the record.

[The information follows:]

The Binary Chemical Warhead (BCW) for the MLRS provides the Army its only mid-range chemical capability and adds the third element of binary systems needed to ensure deterrence. The relatively small cost of the BCW is essential to ensure the high investment the Army has put into its modernization program. Without this chemical deterrence capability the Army could loose all the advantage it has gained in pursuing its extensive modernization effort.

The Binary Chemical Warhead (BCW) for the MLRS provides the mid-range capability to hit targets in the enemy's 2nd Echelon. This is a capability the Army currently doesn't have now and a capability that neither of the other two new binary systems will provide. To have an effective chemical deterrent capability we must be able to hit targets with chemical agents over the depth and width of the battlefield with the right kind of chemical agent. The 155mm binary projectile is designed to hit close-in targets with a non-persistent agent. The BIGEYE bomb is for use against deep fixed targets using a very persistent chemical agent. The MLRS provides the Army with an unmanned all weather capability to engage mid-range targets such as large moving troop formations or reinforcing artillery units with large volumes of semi-persistent chemical agent. The BCW is essential to the Army's chemical capability and it compliments the other two binary systems to ensure an overall military effective capability exists to support the national policy of chemical deterrence.

Mr. DICKS. How many other kinds of warhead are planned for MLRs, and how many other vehicles besides rockets are planned for MLRS launchers? What are the operational implications of these complications?

I am talking about other systems now.

Mrs. HOEBER. There are a number of different types of warheads for the rockets, for the MLRS.

Mr. DICKS. Please give a description for the record.

[The information follows:]

The other types of MLRs warheads besides the Binary Chemical Warhead are as follows:

A. Dual Purpose Improved Conventional Munitions (DPICM)

B. Sense and Destroy Armor (SADARM)
C. Army Tactical Missile System (ATACMS)
D. Terminal Guidance Warhead (TGW)

In addition, the Germans are developing an antitank mine warhead (AT2) for use with the MLRS rocket.

All the above warheads with the exception of ATACMS use the basic MLRS rocket motor as a propelling system. ATACMS is a MLRS launched 22" ballistic missile which will carry an antipersonnel/antimaterial (APAM Block I) warhead and smart antiarmor submunitions (Block II).

The Army has also announced that it is working with the AF on a Joint Tactical Cruise Missile System (JTACMS) which would be launched from MLRS.

The operational implications are that target attack must be carefully orchestrated to match the appropriate warhead against the target and that ammunition storage and resupply must be coordinated so that units have the required munitions at the required place and time similar to the manner in which ammunition management in cannon artillery takes place. Attack of deep targets with ATACMS will require precise and timely targeting information provided directly from sensors thru the Ground Station Module located with the MLRS battalion.

**Mr. Dicks.** What are the operational characteristics of these various systems?

[The information follows:]

The operational characteristics of the MLRS warheads are depicted in this chart:

| Warhead | Targets | Range | Attack mechanism | Guidance | Number of submunitions |
|---|---|---|---|---|---|
| DPICM | Trucks, troops, soft armor | 32 KM | M77 Bomblet (ICM) | N/A | 644 per rocket |
| SADARM | Artillery mortars | deleted | Explosively formed penetrator | MMW&IR | 6 |
| ATACMS BK I | Command post ADA sites Helo Rearm/refuel points | do | M74 Bomblet | Dynamic tuned gyro | 1,000 per missile |
| ATACMS BK II | Moving armored vehicles | do | Smart munitions | Varies with Submunition | Varies with Submunition |
| TGW | Clusters of armored vehicles | do | 4-inch shaped charge | MMW seeker | 6 TGSMs per rocket |

**Mr. Dicks.** Mr. Chairman, thank you very much.

**Mr. Murtha.** The gentleman from Ohio.

## Demilitarizaton of Chemical Weapons

**Mr. Miller.** Thank you, Mr. Chairman.

Dr. Welch, in your statement you say that you are requesting $120 million for destruction of chemical munitions.

Can we go into a little more detail as to how you would accomplish this?

**Dr. Welch.** Yes, sir. I would ask that Ms. Hoeber address that.

**Mrs. Hoeber.** Would you repeat the question, please?

**Mr. Miller.** In the budget and the statement presented there is a request for $120 million for destruction of the chemical munitions, and I would like to have a little additional information as to how you neutralize them or what you do with them in order to destroy them.

**Mrs. Hoeber.** Well, our basic method of destroying the chemical munitions is to incinerate. We will incinerate the agent and the metal parts to destroy the agent on them. We are looking at two particular ways of getting the systems ready for incineration. First, we have a way of taking them apart and separating the agent from the other piece parts and putting them in separate incinerator. We have a new technique called cryofracture which will freeze and fracture the munitions and dump all the pieces in one incinerator. But the basic mechanism is incineration.

We have submitted a detailed plan to the Congress last month on this technique for your perusal.

Mr. **MILLER**. Also, I notice in the statement that it says the destruction effort and the modernization effort are linked, and if you did not have the $815 million that I see on page 12 that you are requesting for fiscal year 1987, then we would not destroy the munitions that we have, is that correct?

Mrs. **HOEBER**. We cannot destroy all that we have unless we get adequate binaries. At the moment, we have 10 percent of our stockpile, which is at least somewhat military usable. The remainder is not and it would be appropriate to destroy that as rapidly as we can.

Mr. **MILLER**. The 10 percent that we have now, would the NATO nations accept that in their country, stored there in case it was needed?

Mrs. **HOEBER**. Today we have some stored in Germany, sir. We have no plans or intentions to store any more in Europe.

Mr. **MILLER**. And with the amount of binary chemical warfare weapons that the $815 million would produce, would they be stored in NATO nations?

Mrs. **HOEBER**. That is total budget, not just for binary production but our current plan is not to store any of the binaries anywhere except in the continental United States.

Part of the bill that was passed last year discussed the storage of the different components in different states, as you may recall.

Do you want to address that?

Dr. **WELCH**. I would like to point out that the $815 million is the defensive part of our request. The part that deals with retaliatory systems is approximately $200 million. Not all of that is for the binary production. It also includes some research and development as we pointed out in our statement.

Now, the only part that is linked between destruction and production is that part of that $200 million. The linkage is that as we produce, we will destroy.

Mr. **MILLER**. What are we saying in talking about protective measures? Are we talking about suits to protect our men in the field?

Dr. **WELCH**. Yes, sir, that is correct. It includes suits, detectors, decontamination systems, underground protective shelters for our air bases in Europe, all those things that would cause a potential user to think twice before he puts chemical weapons on us.

Mr. **MILLER**. Underground protection, is it possible to filter out the chemical so that you could still move air into the underground base or holding or controlled area?

Dr. **WELCH**. Yes, sir, that is exactly what we are doing and there is a good example of this at the air base at Spangdahlem AB, Germany. We can now maintain a sortie rate that we could not do before when people were required to stay above ground in those contaminated conditions. It has a great payoffs and we are urging all the services to pursue this underground filtered air system.

Mr. MILLER. Would one filter work for all or would it be possible for a different type chemical to be used and that filter not be effective?

Dr. WELCH. We should not lose sight of the fact that the Soviets have known agents. We have been building filters to protect troops against the known agents. We are also actively engaged in systems that would replace the filter and would be effective against all agents, the known as well as anything the Soviets could introduce. That is all we can do.

New agents is not a reason to decrease funding in this defensive area. We need that $815 million just based on the known agent threat that they can put on us.

Mr. MILLER. There was an article in the newspaper indicating the Canadian Defense Department did an analysis of a plastic bag reportedly dropped by a plane over Thailand. This analysis concluded it is probable that chemical biological weapons were used in Southeast Asia.

Do you have any information on the Canadian study that you could give us at this time?

Dr. WELCH. You must let the Canadian report speak for itself. We do concur in the finding of the Canadian Government. We do concur and agree that chemical and toxic agents have been used in Southeast Asia.

There is a linkage to the Soviet Union. In addition to the physical samples that the report mentions, ——— casualties and the symptoms the casualties have been described.

The picture is clearly one of Soviet client states using chemical weapons in Southeast Asia. There is no question about that.

Mr. MILLER. Do you and the CIA differ as much in your assessment of the Soviet chemical weapons threat to NATO as testimony has indicated?

Dr. WELCH. ———. There is always a legitimate issue raised when you talk about intentions. This is true of nuclear and it is true of conventional as well as chemical. ———. Our position has been a prudent one. ———.

It is hard for me to believe that they would maintain this capability to the degree they do if they don't intend to use it. I look at Afghanistan and Southeast Asia, where the Soviets are using agents. That tells me they intend to use them in other contexts.

Mr. MILLER. Thank you.

## BIGEYE BINARY CHEMICAL BOMB

Mr. MURTHA. Let's talk about the BIGEYE binary chemical bomb, phase 1 operational testing.

The budget includes $28.5 million for the Navy and $28.4 million for the Air Force to procure the BIGEYE binary chemical bomb. This will be the first year of procurement for BIGEYE.

Last year, Congress transferred $6 million budgeted for procurement to R&D for additional operational test and evaluation. Phase I operational tests for BIGEYE were completed last January.

What were the results of those tests?

### PHASE I OPERATIONAL TESTS

Dr. **Welch**. I would ask Admiral Flatley to respond to the BIGEYE question, if that is all right with you.

Admiral **Flatley**. Good morning, sir.

The results of the tests for both the Navy and the Air Force were worded identically, potentially operationally effective, and both services support limited production provided the deficiencies identified during both services testing be corrected prior to testing.

Mr. **Murtha**. Is that what potentially means, that you have got deficiencies you have to overcome?

Admiral **Flatley**. Yes, sir, if the few deficiencies are corrected and proven corrected during testing——

Mr. **Murtha**. What are the caveats the Navy has placed on proposed limited production?

Admiral **Flatley**. Specifically we want to pin down delivery accuracy. That was brought——

Mr. **Murtha**. Are you talking about the production delivery or delivery of the BIGEYE?

Admiral **Flatley**. We are talking about delivery of the test vehicles at this point.

Mr. **Murtha**. I am still not clear. That is production delivery, is that what you are talking about?

Mr. **Dicks**. No, getting the bomb on target.

Mr. **Murtha**. Delivery of the weapons, all right.

Admiral **Flatley**. Physically from the airplane to the ground.

Mr. **Dicks**. What happened? What were the problems?

Admiral **Flatley**. Well, one of the things—over time, the test and evaluation plan in my personal estimation, I am late arriving on scene here in Washington, picking up the program about six months ago, the test and evaluation plan was not written as professionally as it could have been and that is a long-standing attempt, the starts and stops in the BIGEYE program have been many and over a large number of years. It started in the late 1960s.

One of the things we found out, and sort of driven by affordability, we may have shot ourselves in the foot here, but we have tried to get through this first phase of testing, delivering as few weapons as possible to save money and test weapons, and instead of doing like we will do in action and deliver a string of six or eight or two strings, we are delivering one weapon, hoping that the wind and the computer and everything brought it all to a perfect——

Mr. **Murtha**. You are saying you have got problems with this thing yet.

Admiral **Flatley**. We have problems with the way we approach the testing. We have absolutely no question about the results of the testing, the next phase of testing turning satisfactory in this respect.

Mr. **Murtha**. The Air Force has the same basic problems?

Admiral **Flatley**. Yes, sir. We are rewriting the test plan to address this properly and effectively.

Mr. **Dicks**. What was wrong with the test plan, following up on Mr. Murtha's line of inquiry?

Admiral **Flatley**. In this specific area, the problem with the test plan is that we pinpointed a bull's eye rather than an area to disperse this gas over, and we delivered——

Mr. **Dicks**. You mean the test was too tough, you made the test too difficult?

Admiral **Flatley**. Because we only delivered one weapon and expected that to satisfy the results that a string of weapons would have given us, six or eight bombs disseminating the same amount of gas that the one disseminated to cover this designated area.

Mr. **Dicks**. So you are going to go back and rewrite the testing plan?

Admiral **Flatley**. No, we are just going to be smarter.

Mr. **Dicks**. Is the independent DoD test agency involved in this?

Admiral **Flatley**. Very definitely.

Mr. **Dicks**. Are they——

Admiral **Flatley**. Supporting our approach to OT-2B testing, very much so.

Dr. **Welch**. They are involved in the design of the next operational test plan to ask the right questions.

Mr. **Dicks**. Is the Air Force here?

Admiral **Flatley**. No, sir.

Mr. **Dicks**. Let's go to this then.

What caveats has the Navy placed on proposed limited production for BIGEYE? What are the other problems? You said there were some problems, delivery was one. What other problems did you have?

Dr. **Welch**. I disagree that delivery was a problem. It was at the right place in space. There was no accuracy problem.

The problem was this: The starting point for a chemical weapon, the measure of effectiveness is that it is an area weapon system; one bomb covers a third of a square mile, typically you drop six or ten BIGEYEs on a target because the target is an airfield or depot.

The question that should have been asked was——

Mr. **Dicks**. Why didn't you do that in the first place?

Admiral **Flatley**. Because we haven't built a weapon like this since World War I. There was nobody to write the test plan. I am making excuses for somebody that did this seven or eight years ago.

Dr. **Welch**. It is unacceptable to me that the second test plan would make the same mistake. We have asked the Services to go back and ask the realistic battlefield question.

Mr. **Dicks**. What happened? The bomb didn't land where it was supposed to, or it didn't have the coverage you expected?

Admiral **Flatley**. Didn't provide us the coverage we wanted, one weapon did not provide the area coverage that we laid out the template on.

We know full well if we deliver two, four, six or eight weapons, we would have inundated the template that was laid out on the desert floor.

Mr. **Dicks**. What other problems were there in the testing?

Admiral, is your responsibility the test program? Are you responsible——

Admiral Flatley. No, sir. I am the OPNAV coordinator for BIGEYE. I work for Admiral Hogg in the Naval Warfare Directorate. I coordinate between OP-05——

Mr. Dicks. Who is responsible for the program?

Admiral Flatley. Captain Marsden from the Naval Air Systems Command.

Mr. Dicks. Captain, what else went wrong on the test program? I believe you can fix problems. We are asking you here because we are going to get asked on the floor, told on the floor by others opposed to BIGEYE that there are problems remaining and that the test pointed those problems out.

This is a secret session. I hope you will be candid with the committee and lay these things out and tell us what you are trying to do to develop fixes.

Captain Marsden. We had not in fact used chemical weapons in a number of years or attempted to release them from the aircraft with a stand-off capability. The testers aimed the weapon at a point target. It is an area weapon——

Mr. Dicks. It is not a smart system?

Captain Marsden. No. It goes up, it has a center for altitude to dispense the agent, but we aim at a point target and expected to cover that. We underestimated the effect of wind on the agent.

We find in all cases we can disseminate a given amount of agent on the ground of any deposition against it we desire. The point is we want to put it on the target. If the target is an area we have to aim different.

Admiral Flatley referred to the fact that we haven't perhaps funded for enough weapons to cover an area. We would use four, eight, 12——

Mr. Dicks. In other words, you do not have enough test weapons?

Captain Marsden. The way we are evaluating it is one weapon at a time and expecting to determine from that what our area coverage will be.

Mr. Dicks. How many weapons does one aircraft carry?

Captain Marsden. An A-6 is capable of carrying ——— weapons at this time and could carry conceivably more.

Mr. Dicks. Is this testing on the cheap that got you in trouble?

Captain Marsden. That may be a way of saying it. We tried to test one weapon at a time and conserve assets and learn as much as we can. We may be short-changing ourselves.

Mr. Dicks. So in the next series of tests you will use more weapons and try to correct for the problems you had with the wind?

Captain Marsden. We will have more weapons to test with and have learned a great deal from the initial operational testing.

One of the main issues is that we will use a number of more weapons in testing. We are evaluating the concept and evaluating how exactly to use the weapon.

### CONCERNS ABOUT ENTERING PRODUCTION

Mr. Murtha. What caveats specifically, Admiral, do we have before going into production?

Admiral Flatley. Improved delivery accuracy, verified disposition density pattern, that is of the dispersed gases, is it falling in such a density or at such a lethal effectiveness that we incapacitate or kill, deciding what we intend to do; reliability.

We have a couple of fuse problems. The Congressman mentioned testing on the cheap. You know, we have essentially thrown this weapon together from off-the-shelf items to keep it affordable. We have poured an awful lot of money and effort into making it super safe, hence, binary, hence, store one part in one state and another part in another state. It is transported on our ships at sea; that is about the only way we will get it across the ocean.

It has to be safe. Hence, don't put the second piece of equipment in the bomb that makes it a bomb until it is already on the airplane, just a few minutes prior to launch.

All of those have been very expensive.

Mr. MURTHA. The second thing, you are talking about not putting the two chemicals in proximity——

Admiral FLATLEY. Until just prior to launch. And those chemicals are not put in a position to mix until the bomb has actually left the airplane, so in going through these motions, a whole lot of the cost of BIGEYE has gone into safety for psychological reasons and others.

Mr. DICKS. Would the chairman yield?

You said the second issue was density of deliverability. Does that mean you have to drop the bombs in different places in order to cover the field?

Admiral FLATLEY. Predict the wind and drop a sufficient string of bombs to waft over the target area to do the job we want them to do. That may be just to incapacitate, which I hope is the way we approach it, or the dosage may be such as to be lethal, depending on what the enemy has coerced us into.

### BIGEYE RELIABILITY

Mr. DICKS. You mentioned reliability. What is the required reliability for BIGEYE?

Admiral FLATLEY. We want ———. We look at it from area dispersion, what a string of weapons will give us in terms of battlefield effectiveness.

If we had structured the program such we would have met our weapons field effectiveness ———. We are doing one weapon at a time and judging just from that.

From a practical standpoint, I think we are there, but we are going to make this weapon a little more perfect and it is going to cost a few more bucks.

### IMPULSE CARTRIDGE REDESIGN

Mr. MURTHA. You mentioned about the proximity of the two chemicals. What change is being considered to the impulse cartridge?

Admiral FLATLEY. Now that is in line. The simplest way to explain that is one of the challenges we have to satisfy everybody is if an airplane is over land and takes a hit and wants to jettison these weapons, wherever it might be, friendly territory or enemy, unbelievably we expect that weapon to go down with this combination of elements in it, not necessarily mixed, shattered pieces, and not have any of this mixture go off.

With this in-line cartridge, that impact might cause this reaction to take place. We take the cartridge out of line so that impact will not cause that to happen.

Mr. **Dicks**. Are you saying that this thing could explode prematurely?

Admiral **Flatley**. No. No, I said one of the test criteria is that even if we intentionally drop this off the airplane, because we have got a problem, we took a hit, we are going to crash, we don't want to take it back to the field; we don't want to take it back to the carrier; we have laid the requirement on ourselves if we do this over land and it goes down there and hits the ground and goes in a million pieces and the liquids mix together, because that is what is going to happen in that case, that no chemical reaction take place.

The way we are trying to satisfy and meet that requirement is to take this impulse cartridge that is in line and through impact could cause the reaction, we are taking it out of line. It is just—physically it is not going to be in a position to create this reaction despite the circumstance of the drop.

This is a product improvement. It will be incorporated after the weapon is produced. There is absolutely no risk to what we are doing.

Mr. **Murtha**. When will the changes be tested?

Admiral **Flatley**. That change will be tested after we are into full production, because there is no risk. It is a simple mechanical engineering thing to accomplish.

Mr. **Hefner**. Would the gentleman yield?

Mr. **Murtha**. The gentleman from North Carolina.

Mr. **Hefner**. I wanted you to explain, you take it out of line; what do you mean by that?

Admiral **Flatley**. It is like a bullet in a rifle barrel.

Mr. **Hefner**. The components are in line?

Admiral **Flatley**. Yes, sir.

Actually, the ballonet with the two primary components, you have the big bomb full of liquid and the ballonet with the other substance is inside that. The impulse cartridge is in line with the ballonet surrounded by one of the two liquids. You want to take that out of line so that on impact, that impulse cannot take place.

Mr. **Hefner**. But it has to be on line when it is fired?

Admiral **Flatley**. Yes, sir, so the fusing brings it in line after it is released from the airplane.

Mr. **Hefner**. Is that not a problem?

Admiral **Flatley**. No, sir.

Mr. **Hefner**. Piece of cake?

Admiral **Flatley**. Yes, sir, a piece of cake, absolutely.

Dr. **Welch**. It is standard, of course, and this would not be the first system to use it by any means.

I would like to point out that the pilot has the opportunity to jettison the BIGEYE bomb safely. One of the components the QL liquid, is bled out and no agent is formed. So even though the bomb impacts on the Earth, there is no possibility of making agent because you have already dumped one of the components.

The second observation to this discussion, I don't consider accuracy to be an issue. The BIGEYE bomb and all it drops was put in space just where it should have been when it started to spray. The problem is the way the testers asked the question.

For the MLRS, for the 155mm, artillery for the Soviet Scud, for the World War I artillery chemical round, it has been a matter of necessity that you put down enough chemical weapons to cover an area target. That means you put some to the right and some to the left, and when the wind blows it over the target, you get the job done. ———. The accuracy is not an issue.

The issue is asking the right question, drop the right number of bombs and come back and tell me whether or not you have covered the target or you didn't.

We are insisting, of course, that the Navy do this for the next operational test.

## SECRETARIAL REPORT

Mr. **Murtha**. Last year Congress directed the Secretary of Defense to submit a report describing the operational requirements for BIGEYE and the actual performance of BIGEYE during operational tests with respect to each of the operational test criteria.

Have operational test criteria been established for BIGEYE?

Dr. **Welch**. They have been established and as we have heard in the last ten minutes, we are refining those operational requirements.

As I mentioned in my opening statement, my office is rejecting some of the requirements that the Navy has stated.

Mr. **Murtha**. Let me ask you a question. Have operational test criteria been established for BIGEYE, yes or no?

Dr. **Welch**. Yes, sir.

Mr. **Murtha**. When were they established?

Dr. **Welch**. They have been established originally back in the late 1960s as I recall. And the formal statement of what those requirements are has been passed to the GAO and also will be passed to the Congress by the Secretary in a few weeks.

Mr. **Murtha**. And they are not being changed then, we could look forward to the criteria that has just been set up and established for BIGEYE as being the criteria that you will administer your tests?

Dr. **Welch**. That is correct, and let me make sure you understand my position on that.

There have been good operational battlefield criteria for this chemical weapon, area coverage, casualty production, causing the enemy to get into protective posture, degradation, all those things. Where it has gone astray is that has been translated into technical specifications which are now acting as surrogates for those operational requirements. That translation was not perfect in all its ways.

For example, the ——— there is no way that you can get a bomb over target at that kind of temperature.

Mr. **Murtha**. You are saying the test criteria has not been established.

Mr. **Welch**. The technical test criteria is wrong and I am insisting that it be changed.

Mr. **Murtha**. We can't have it both ways here. It has not been established; you are in the process of establishing it. When will it be established?

Mr. **Welch**. The Secretary's letter to the Congress will be very specific as the Congress asked for, the statement of test criteria to include the things that we would waive or change.

Mr. **Murtha**. When will we get that letter?

Dr. **Welch**. Approximately ten days——

Admiral **Flatley**. It is due to Mr. Weinberger on 1 May.

Mr. **Murtha**. So we will get it shortly after that.

Have pass-fail thresholds been established for each operational test criterion? If not, how can you determine the success or failure of BIGEYE?

Dr. **Welch**. Yes.

Mr. **Murtha**. Provide for the record the BIGEYE operational requirements, the test criteria and the pass-fail threshold for each.

[The information follows:]

## OPERATIONAL REQUIREMENTS

1. *Background.* The Air Force and Navy have had a long standing operational requirement to replace their existing unitary chemical weapons with a munition which uses the binary design principle. The operational requirement for this binary chemical weapon (BIGEYE) is established in Navy Specific Operational Requirement (SOR) 11-08C *Binary Chemical Bomb (BIGEYE)*, dated 18 September 1967, and Air Force Required Operational Capability (ROC) for an *Air Delivered Lethal Binary Chemical Munition* (ROC NO: TAC 22-71), dated 25 August 1971. A Joint Development Plan (JDP) was developed to combine these requirements and other program information into one document. The latest version of the JDP, is dated July 1982. Where Navy and Air Force requirements differ, the requirement stated in the JDP shall have precedence. The following paragraphs summarize the operational requirements as identified in these documents.

2. *Operational Requirements.* To provide a chemical weapon in which the lethal agent VX is formed by mixing two non-lethal chemical within the weapon (binary design principle) after it is airborne and prior to release from the aircraft.[1] The weapon shall be compatible with present and planned tactical fighter and attack aircraft and with AO, AOE, CVA, LPH and LPA type ships.[2] The chemical weapon shall be safe to handle and store. The weapon must not present any contamination hazard to aircrews of airlift and delivery aircraft such that personnel involved in transporting, maintaining storing, or loading can perform their duties while wearing normal work uniforms without the need for special protective clothing.

a. *Employment.* BIGEYE is to be employed in standard delivery and attack modes to disperse the lethal agent VX over relatively wide areas. The weapon must be compatible with arrested landing and catapult take-off (including Short Airfield Takeoff System). It must be capable of being rendered safe (no agent spray) for jettison over friendly territory. Fuze requirements must be compatible with optimum delivery and attack modes, including supersonic external carriage. It shall use a timed fuze, and provision for slant range fuzing shall be provided when the slant range fuze becomes available.

b. *Effectiveness.* Weapon functioning and target effectiveness are delineated as the maximum range of target effectiveness and environments spelled out for the chemical agent. Area coverage should be appreciably greater than currently obtainable from inventory weapons. To be compatible with tactical employment the weapon will produce, upon activation, a minimum of ———.[3]

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[1] The weapon now mixes reactants after release from the aircraft as required in ROC para IX.C.2.

[2] Reflects incorrect and superseded ship designations. AO should be AE and CVA should be CV.

[3] The time interval stated reflects the requirement for the on-station mixing concept with delivery altitude higher than desired for present threat environment. To reflect current design for off-station mixing and primary delivery technique of loft maneuver, the requirement is revised to ———.

c. *Reliability.* Reliability of the weapon shall be 90 percent operation at a confidence factor of 80 percent for weapon functioning which will include generation of the agent and subsequent thereof.

d. *Logistics.* Special storage and handling equipment or procedures are not to be required during the logistic cycle. Storage capability must be compatible with existing shipboard magazine designs. Storage capability (shelf life) shall be limited to shelf life of the reactants with a system design goal ten (10) years. The system shall be simple to assemble, operate and safe from accidental mishaps. The weapon shall be able to be assembled in eight (8) man-minutes (JDP para 3.3). The weapon shall be in the 500 pound category and shall be compatible with existing bomb racks including multiple ejection racks and triple ejection racks.

e. *Training.* No special training for logistics or operating aspects will be required. The assembly, arming and handling of the weapons shall be within the capabilities of existing rating (specialties) now onboard ship.

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### TEST CRITERIA

1. *Background.* The test criteria have been developed from the operational requirements and are specified in the Test and Evaluation Master Plan (TEMP) M612 dated 7 May 1985. This document is currently under review and will be reissued prior to the next phase of operational testing.

2. Test criteria and pass/fail thresholds are as follows:

| Test criteria | Pass fail threshold |
|---|---|
| [Deleted.] | [Deleted.] |
| Weapon system reliability. (Given that the bomb rack arming unit functions properly and that release occurs, the probability that VX agent is generated, tail fins deploy, forward and rear ports open such that VX agent can be disseminated). | 0.90 at 80 percent lower confidence level. |
| Total shelf life (in container) | 10 years. |
| Weapon Service Life (out of container) (AF only) | 1 year. |
| Aircraft delivery mode | [Deleted.] |
| BIGEYE weapon carriage speed (max) | Supersonic. |
| BIGEYE weapon delivery speed (max/min) | [Deleted.] |
| Assembly time (max) | 8 man-minutes. |

Mr. MURTHA. Please answer the remaining questions on BIGEYE for the record.

[CLERK'S NOTE:—Question submitted by Mr. Murtha and the answers thereto follow:]

*Question.* What specific tests will serve as the basis for the report? Provide a general description and the specific test numbers for the record.

Answer. The information provided by the Secretary of Defense in his report will be taken from several sources. Most of the information comes from operational testing conducted by the Navy and Air Force. A total of forty-two test weapons were delivered by a combination of Navy A-6 and Air Force F-4 and F-16 aircraft. Testing was conducted at the U.S. Army Proving Grounds Dugway, Utah and at the Naval Weapons Center Test Range China Lake, California. Navy operational testing was conducted under CNO project M612-OT-IIA and the report was published 17 January 1986 in Commander, Operational Test and Evaluation Force letter 3900 Ser 50/C010. Air Force operational testing was conducted under Tactical Air Command (TAC) Project 85C-002T. The results of the Air Force testing are expected to be published in June 1986 and a copy will be provided to GAO.

The report will also contain information on lethal agent generation that was obtained from testing conducted by the Army Chemical, Research, Development and Engineering Center, Aberdeen, Maryland. Chemical agent testing was conducted in toxic chambers using both chemical reactors and BIGEYE dispenser mechanisms. Chemical agent testing was conducted during developmental testing and was completed in July 1985. Results of chemical testing were reported individually for chemical tests L-1 through L-42, copies of which have been provided to GAO.

*Question.* Last year the conferees stated their intention to have the Secretary's report reviewed and certified by the Comptroller General. When will the Secretary's report be issued?

Answer. We expect the Secretary's report on BIGEYE testing to be issued in June.

*Question.* To what extent have you shared test results to date with representatives of GAO?

Answer. We have provided the GAO copies of technical reports and documentation on BIGEYE testing, as well as the Navy's report on the first phase of the their operational testing. In addition, we initiated several face-to-face meetings with GAO personnel in an attempt to discuss the tests results, clarify any points of misunderstanding, and answer any questions that the investigators had about BIGEYE testing. GAO has also been provided an outline of the report to be submitted by the Secretary of Defense and the complete set of operational requirements and operational test criteria. It should, therefore, be possible for GAO to develop independently their own conclusions concerning BIGEYE performance against the specified criteria and thus facilitate their comments on the Secretary of Defense submission.

*Question.* When will the reports on the Navy and Air Force Phase 1 operational tests be issued? Will this be in time to assist GAO in their review of the Secretary's report?

Answer. The Navy report on Phase I testing, Operation Test Phase IIA (OT-IIA), was issued 17 January 1986. It has been released to the General Accounting Office (GAO). The Air Force Phase 1 report is expected in early June 1986. This will be given to the General Accounting Office (GAO) as soon as it is released and should be in time to assist GAO in their review of the Secretary's Report.

*Question.* Why are two phases of operational testing required?

Answer. It is not unusual for operational testing to be divided into two or more phases. In the case of BIGEYE, Phase DNE operational testing provided for the initial operational test for the purpose of determining the potential operational effectiveness and potential operational suitability. In addition, it permitted the completion of all the, then scheduled, toxic chemical chamber development tests. It also provided for procurement of additional test weapons needed to fully test BIGEYE after the change in operational concept from on-station to off-station mixing.

Phase one operational testing has been completed and BIGEYE has been evaluated by the Navy testing organization as being potentially operationally suitable and potentially operationally effective. All the toxic chemical chamber tests originally scheduled during developmental testing have been complete and the results have been received. The additional test weapons have been procured and are currently being prepared for use in the next phase of operational testing. These test weapons will incorporate modifications that were recommended as a result of the Phase 1 operational test evaluation.

*Question*. What specific offices within the Office of the Secretary of Defense will review the Secretary's Report? Specifically, will the Director of Operational Test and Evaluation approve this report?

Answer. Within the Office of the Secretary of Defense, the following organizations will review the Secretary of Defense's report on the BIGEYE binary chemical bomb

Under Secretary of Defense for Research and Engineering;
Director, Operational Test and Evaluation;
Assistant Secretary of Defense, Acquisition and Logistics;
Assistant to the Secretary of Defense, Atomic Energy and Chemical Matters.

### ADDITIONAL OPERATIONAL TESTING

*Question*. Last year, Congress provided $6 million for "additional operational testing." This was done at the suggestion of your department as part of the compromise in the appropriation conference. It now appears that no additional testing will take place since all forecasted tests were already planned last year.

Answer. Phase II operational testing is scheduled to begin late this fiscal year. Funding to support this testing was to come from reprogramming action as the estimated cost was below the reprogramming threshold. The $6.0M provided by Congress as part of the compromise in the appropriation conference will now be used to fund this testing. These funds will also be used to incorporate the modifications into the weapons to be used for Phase II testing that were recommended after completion of Phase I testing. Total cost for weapons modifications and testing is estimated to be $3.2M. Several additional chemical tests have been identified by GAO and the Navy and Air Force testing organizations. Conduct of these tests, at an estimated cost of $1.0M, will be accomplished using these funds. The remainder of this funding will be applied to the development of a modification to the initiation system of the ballonet impulse cartridge. This modification was recommended by the Service's Weapon Safety Board. When functioned, the impulse cartridge injects sulfur into the QL to form agent VX. The modified cartridge will be incorporated into the design and will be part of all production weapons.

*Question*. Is the $6 million really just an over-run in the testing program?

Answer. The $6 million provided by Congress will be used to conduct Phase II testing which has been part of the program schedule. Part of these funds ($4.2M) will provide; (a) build-up of test weapons with modifications determined to be necessary during Phase I testing, (b) USN/USAF aircraft support services, (c) range support services for Dugway and China Lake test facilities, (d) data reduction for all test data obtained, (e) report preparation, (f) additional chemical testing to be conducted by the Army Chemical Research Development and Engineering Center. The remainder of the funds will be applied to the development of the modification to the initiation system of the impulse cartridge system that will be incorporated into all BIGEYE production weapons.

*Question.* The $6 million is not available until 60 days after the Secretary submits his report on BIGEYE and until the President certifies that certain conditions concerning North Atlantic Treaty Organization (NATO) have been met. Since these events have apparently been delayed, what impact will this have on your testing program?

Answer. The Secretary of Defense report on BIGEYE is being staffed and is expected to be submitted in June. The North Atlantic Treaty Organization (NATO) actions are proceeding on schedule. If funding release should be delayed there would be a month for month impact on the Phase II testing program.

### BIGEYE PROCUREMENT STRATEGY

*Question.* What is the procurement strategy for BIGEYE?

Answer. BIGEYE procurement strategy is to conduct a low rate initial production (LRIP) program for one year beginning in FY-87. Full production will be conducted over seven consecutive years using a dual source competition concept. A systems contractor approach is to be used as it is planned to procure BIGEYE with a metal parts warranty.

*Question.* If a system contractor approach is to be followed—

(A) Who will that contractor be?

(B) Who would it be if a second metal parts producer is established?

(C) Justify this approach when component breakout has been found to be most efficient and cost effective for other programs?

Answer (A): The metal parts LRIP and first full production contract has not been awarded, therefore no contractor has been identified.

Answer (B): The second metal parts contractor will be selected in FY-88 based on competition.

Answer (C): BIGEYE is planned for procurement under a system contractor approach because a system performance warranty is strongly desired. A system performance warranty is being sought because the BIGEYE is planned for a ten year shelf life and in all likelihood it will remain in storage for at least that period. In order to ensure to the fullest extent possible that the bomb will function as reliably as possible at least up to the time of its shelf life, a contractor warranty is considered appropriate. This BIGEYE warranty concept is currently in development. It will most likely be very similar to the warranty developed by the Air Force for the Tactical Munitions Dispenser (TMD) weapon system. It will include periodic stockpile weapon performance tests (using simulants) and weapon teardowns to determine component functional integrity. Penalties for failures in system performance will be imposed by means of withholds against contractor profits.

[CLERK'S NOTE.—End of questions submitted by Mr. Murtha.]

Mr. MURTHA. The gentleman from Pennsylvania.

## ADEQUACY OF CURRENT STOCKPILE

Mr. **McDADE**. Thank you, Mr. Chairman.

There was a comment made, I believe, by Ms. Hoeber about the existing inventory that we have, and you indicated that it was 90 percent defective; was that what you said?

Mrs. **HOEBER**. Yes, sir. That was the current unitary stockpile, of which about 90 percent is today of no military utility.

Mr. **McDADE**. Why has it no military utility?

Mrs. **HOEBER**. Several reasons. A large part of it is in bulk. It is stored in big bulk container drums, and there are no facilities available to fill that into munitions of any sort.

Secondly, there are old type systems such as——

Mr. **McDADE**. Let me stop you right there, may I?

You said that a lot of them were in tanks, did you?

Mrs. **HOEBER**. No, in big drums, in drum containers Here is the way it breaks out: 61 percent is in bulk containers, 11 percent is in unrepairable and obsolete systems such as for chemical the M-55 rocket system, which is causing us some leakage problems and things like that. Eighteen percent there is in improper munitions for today's military uses, things like mines, which we wouldn't want to use today given a fluid battlefield, and only 10 percent is in military usable current munitions.

Mr. **McDADE**. There are a lot of people who would argue that we have more than enough of a chemical deterrent now. What is your response to that?

Mrs. **HOEBER**. I don't believe that is accurate, sir. Our calculations show that we need about ——— of the existing agent tonnage for a militarily adequate deterrent. We need it in different form than we have today. We need it in the binary form so that we can move it around the battlefield so that we have no danger to our soldiers on the battlefield.

Mr. **McDADE**. I understand the dangers, but I want you to address yourself to the argument that many people make that there is a sufficient amount in the current inventory to act as a deterrent.

Mrs. **HOEBER**. We do not believe that is true. We believe we need approximately double ——— that is today military useful to provide an adequate deterrent.

Mr. **McDADE**. We have an official document that indicates that there are about ——— weapons which are classified ready for use, 155 projectiles, and also ——— there are two different types, one is GB and one is VX. That is almost ——— rounds, is that right?

Mrs. **HOEBER**. It is about right, yes.

Mr. **McDADE**. Why isn't that enough?

Mrs. **HOEBER**. Well, the VX artillery shells are not particularly useful. VX is a persistent agent which can last for days or even weeks if the temperature is low, and you don't want to use that in artillery shell right in front of your own troops.

Mr. **McDADE**. You classify it ready for issue?

Mrs. **HOEBER**. Yes, because that is what we have available if we had to retaliate to a use against us.

Mr. **McDADE**. We are going both ways, on the one hand it is not useful, but it could be if we were attacked. You are saying you would prefer a new one, but if you were attacked, you would use these and they are effective for use?

Mrs. **Hoeber**. We have no choice. We would have to use what we have in our inventory if we have to retaliate in time. It would put our soldiers at disadvantage.

Admiral **Flatley**. The Navy has looked at this arsenal and we are neither prepared to, capable or willing to transport one ounce of what we have seen on any of our ships from a safety standpoint.

Mr. **McDade**. Of any kind?

Admiral **Flatley**. No, sir.

Mr. **Dicks**. The whole 100 percent?

Admiral **Flatley**. Yes, sir.

Mr. **McDade**. You don't see 10 percent, you see zero

Admiral **Flatley**. From the standpoint of putting it on our ships and transporting it across the ocean.

Mr. **McDade**. The reason for that——

Admiral **Flatley**. The leakage, the projectiles are leaking. There is no way of determining after all these years when that next projectile is going to begin leaking.

Mr. **McDade**. You wouldn't even put them on a ship for retaliatory purposes?

Admiral **Flatley**. Or on the boxcar they are stored in.

Mr. **McDade**. The ones I am mentioning are just artillery you don't use these, do you?

Admiral **Flatley**. No, but we are charged with getting them over there.

Mr. **McDade**. But you wouldn't use the Navy version under any circumstances?

Admiral **Flatley**. No, sir. The mines would be an example.

Mrs. **Hoeber**. It is not just the leakage that is a problem. For example, if they were stored onboard a ship that got hit by an opponent, then you could have agent release on the ship from the things in your own storage hold.

Mr. **McDade**. That was a problem when we built these things, wasn't it?

Admiral **Flatley**. There was no technology when we built them to do anthing else.

Mr. **Murtha**. How much is in Europe already?

Admiral **Flatley**. A very small amount. Do we have the number? ———.

Mr. **McDade**. What is the difference? You said if the current inventory was on a ship for hypotethical purposes and it was hit, it could devastate the people on the ship, et cetera. What would happen with the new system, BIGEYE or the 155?

Admiral **Flatley**. You wold have no lethal agent ever released because it cannot be formed until after the artillery shell is fired or after the bomb is dropped from the aircraft. If you got a hit, it would not mix because they are separated, stored separately, they are never put together until you are ready to fire it.

Mr. **Murtha**. Unless the whole ship blew up.

Mr. **McDade**. The ———, is that the 10 percent you are referring to when you talk about 10 percent available?

Colonel Carruth. GB artillery shells, ——— rounds; for VX artillery shells, ——— rounds; for GB bombs, ———. These are the classified numbers.

Mr. McDade. We have different numbers and we need to get them reconciled.

Colonel Carruth. I don't know what document you are reading from, sir.

Those numbers represent the ready for issue. There are some repairable ones that need minor maintenance so those are classified repairable. The ready for issue are the ones ready to roll out and be issued to the soldier or artillery man to fire.

There are others not ready for issue in our classification, but could be made ready for issue.

Mr. McDade. The Navy won't transport the stuff, the Army will?

Mrs. Hoeber. The Army doesn't transport its own munitions. We rely on airlift for this.

Mr. McDade. Is the Air Force going to transport this?

Mrs. Hoeber. They have in the past and would again if necessary.

Colonel Carruth. They moved the WETEYE bombs from Rocky Mountain to Tooele, Louisiana, Army depot.

Dr. Welch. I think a perspective note is in order. If you look at the artillery munitions in Europe, ———.

The other thing I would like to point out is that we have a requirement to cover the entire battlefield with chemical agents. You are talking here about artillery having some usefulness, but there is no intermediate range capability or deep-strike capability.

Mr. McDade. You would use the whole supply in ———?

Dr. Welch. In Europe.

Mr. McDade. Of the current inventory?

Dr. Welch. Yes.

Mr. McDade. How much is over there?

Mrs. Hoeber. ———.

Mr. McDade. Are they ———?

Mrs. Hoeber. Yes, sir. In ———.

Mr. McDade. You mentioned that a lot of the current stockpile is in drums of various kinds. Why can't you use that inventory and create a more viable——

Mrs. Hoeber. It is neither cost effective to do so nor does it make any safety and logistic sense. We have no existing plants which could use that agent to fill new munitions.

In theory, one could build a plant to do that——

Mr. McDade. You have no facilities to do that?

Mrs. Hoeber. We have no facilities to do that.

Mr. McDade. Thank you, Mr. Chairman.

Mr. Hefner. I have a couple of questions. A great deal of this is stored in bulk in Arkansas?

Mrs. Hoeber. Not a great deal in Arkansas, but there is some there.

Mr. Hefner. A lot of these that are stored in Arkansas, I understood that a lot of projectiles or grenades or shells, that we don't even have launchers?

Mrs. **Hoeber**. That is correct. That is in part 11 percent of no use. There are a number of obsolete munitions for which we have no launchers remaining.

Mr. **Hefner**. What are we going to do with this 11 percent? The Navy says they wouldn't even transport them. How do we dispose of this 11 percent?

I have been there and I know what you go through to even inspect these. Also, there is a substantial amount of canisters that are sitting out in the open that would be, could be a problem for you from terrorists. I don't know what would happen if you threw a grenade or managed to get a bomb in there, but they are sitting out in the open.

Mrs. **Hoeber**. As to the terrorist issue, we protect what we have, I think, very well. We have an extremely good guard force, protect these with double fences and alarms and so on.

Mr. **Hefner**. ———?

Mrs. **Hoeber**. ———.

As to what we intend to do with them in the long run, we will demilitarize the entire unitary stockpile as the binaries are produced, and our plan is in accordance with the congressional directive of last year, get this entire demilitarization job done by 1994.

Mr. **Hefner**. The facility that we are building in Arkansas now, what does that facility do?

Mrs. **Hoeber**. That is the BZ demilitarization facility. That is being built to demilitarize some old BZ, which is a different type thing, but the facility has the capability of being converted to an incinerator facility for the demilitarization of the chemical munitions.

Mr. **Hefner**. So the facility we are building in Arkansas, you could dispose of the portion located in Arkansas——

Mrs. **Hoeber**. Yes, sir.

They would be gone. They would be incinerated.

Now, we have not decided yet exactly where we intend to build the demilitarization facilities. Arkansas is, of course, one of the places in the plan for demilitarization on site, and we will have the record of decision based on the environmental impact process next January as to whether we will build facilities at eight different sites in the Continental United States, or build it in a national site or build two regional sites.

Mr. **Hefner**. This 11 percent that is of no use, is it of no use because of the condition that it is in, potential leakage or of no use because we don't have the launchers?

Mrs. **Hoeber**. Both, sir.

Mr. **Hefner**. A combination, but it is only 11 percent that we have no launchers for in that category?

Mrs. **Hoeber**. What is the division here—there is 400, roughly 400 thousand rounds of GB M-55 rockets for which we no longer have launchers. There are about 109,000 rounds of VX M-55 rockets for which we have no launchers.

Mr. **Hefner**. When did we do away with our capability to have launchers? Did we discontinue that or did we never have them?

Mrs. **Hoeber**. We had them originally back in World War II. I don't remember the date they were actually done away with. A long time ago.

Mr. **Welch**. Several hundred of those rockets are leaking and others are bound to leak over the next few years. They are very old and we want to get rid of them.

Mrs. **Hoeber**. They were technically not particularly good at the time they were built. They are made out of aluminum, which corrodes when it is in contact with the agent, and we are having corrosion through the skins of some of the rockets.

Mr. **Dicks**. What bothers me about this is if this stuff is so bad, why haven't we moved more decisively to get rid of it?

It appears to me that this is being used as part of the political leverage in this whole thing. In other words, we will get rid of these old terrible systems but you have to give us the new weapon first.

If these things are as unsafe as you characterize, I think you have a responsibility to get rid of them right now.

Mrs. **Hoeber**. We are trying to do so as quickly as we can. We had to build a pilot plant facility at Tooele, Utah, and test our process for getting rid of these munitions. We have to go through the EPA permitting process, prove we can do it safely. It has taken this many years to develop an adequate capability to do that.

Mr. **Dicks**. How many years has it taken? How long have we been working on this?

Mrs. **Hoeber**. Working on it since 1970.

Mr. **Dicks**. So we are 16 years into a program.

Mrs. **Hoeber**. Roughly ten years into real work on it. Earlier than that, it was small amounts of R&D.

Mr. **Dicks**. Are you satisfied with the pace?

Mrs. **Hoeber**. If we had more money, we could do it faster.

## BIGEYE BOMB

### PHASE II OPERATIONAL TESTING

Mr. **Dicks**. Let's go back to the Phase II operational testing for BIGEYE.

Phase II operational testing for BIGEYE will extend from June to December of this year, with a report to be issued in March 1987.

What specific things will be tested in Phase II that were not tested in Phase I?

Captain **Marsden**. We learned in our first phase of testing that one round will not do well enough. We will be using more bombs in the testing to evaluate the concept.

We know, given the composition density, we want to show how we can place it on the target.

Admiral **Flatley**. There are two fuse components that showed unreliability in the first phase of testing. One has been brought up to speed through further development and another has been brought completely up to speed through redesign.

Those will be tested throughout the second phase of testing.

Mr. **Dicks**. How many tests constitute the Phase II program? How many different tests?

Captain **Marsden**. We will have ——— weapons to use between the Air Force and the Navy and because in the Navy we have independent testers, I am not personally aware of exactly how many tests the Navy is going to do, but there are ——— weapons.

Mr. **Dicks**. Does the Air Force have independent testers?

Captain **Marsden**. Not as independent.

Mr. **Dicks**. That is why we had to create the DoD office.

Admiral **Flatley**. Each and every one of those bombs is a test in itself, delivering them multiple ways in dive and loft and level—that is how the testing is phased.

Mr. **Dicks**. Obviously the second phase is being required because the first phase wasn't satisfactory, right?

Captain **Marsden**. No, sir. We have had two phases planned always.

Admiral **Flatley**. Every program in the military has the same phases of testing.

Mr. **Dicks**. I am surprised that you have said that you are proposing to make a limited production decision before Phase II tests are completed and analyzed.

Who made that decision?

Admiral **Flatley**. In the Navy's case, OP TEV FOR, probably one of the most respected operational test agencies in the entire country, primarily because they don't let the results out.

Mr. **Dicks**. They approved limited production?

Admiral **Flatley**. Recommended limited production subject to correction of the deficiencies they identified, which we have talked about.

Mr. **Dicks**. You are not going to get the deficiencies corrected until you do the Phase II testing. You are not going to go ahead with limited production until Phase II is over?

Admiral **Flatley**. That is the caveat. We have to——

Mr. **Dicks**. So you have got to get these things corrected before you go into limited production?

Admiral **Flatley**. Yes, sir. Corrections are in place.

Mr. **Dicks**. Is that true for the Air Force as well?

Admiral **Flatley**. Yes, sir.

Captain **Marsden**. We don't contract for limited production until April 1987, so all the testing will be complete by the time we go on contract.

Admiral **Flatley**. What is driving us is the Army facilitization. If we are going to be ready to build in March of 1987, that factory has to start pretty quick.

Mr. **Dicks**. Congress turned you down on procurement money in fiscal year 1986.

Admiral **Flatley**. Yes, sir.

Mr. **Dicks**. But there is a request in the budget for———million for fiscal year 1987?

Admiral **Flatley**. Yes, sir.

Mr. **Dicks**. Is that for the long lead items involved in the limited production or is that for the limited production?

Admiral **Flatley**. Essentially for everything you have just said, ——— for the Navy, ———for the Air Force.

Captain **Marsden**. Limited production for metal parts.

Admiral **Flatley**. Those are metal parts. That is just to put the BIGEYE equipment together. It has nothing to do with the agent.

Mr. **Dicks**. Congressman Miller.

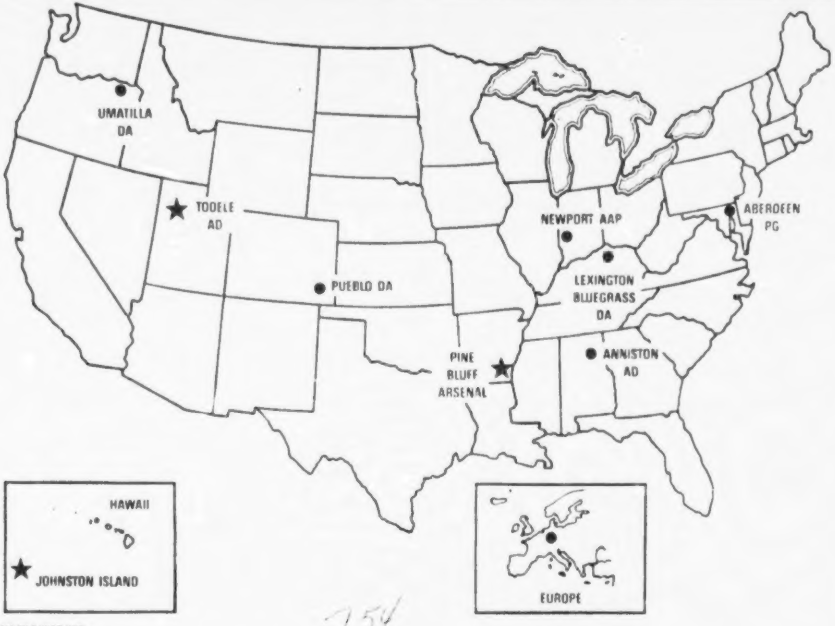
## DEMILITARIZATION OF CHEMICAL WEAPONS

Mr. **MILLER**. I am interested in where those thousands of tons of lethal chemical agents sitting in depots in all parts of the country—that is what it says in the statement—I am interested in the location.

Mrs. **HOEBER**. I have a chart, sir.

[Chart follows:]

# CHEMICAL STORAGE SITES


UMATILLA DA
TOOELE AD
PUEBLO DA
NEWPORT AAP
ABERDEEN PG
LEXINGTON BLUEGRASS DA
ANNISTON AD
PINE BLUFF ARSENAL
HAWAII
JOHNSTON ISLAND
EUROPE

7 VA 0103 DA 85 PIMCS 2/14

**Mr. Miller.** Are they all away from urban areas?

**Mrs. Hoeber.** No, sir.

**Mr. Miller.** And to destroy what is there, would those stocks be moved into some central facility that would be constructed for that purpose of destroying the agents?

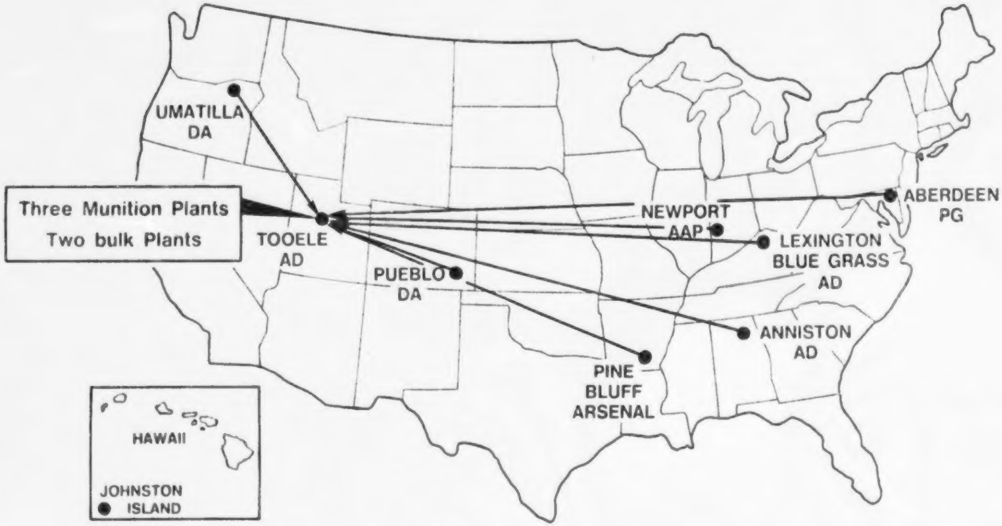
### DEMIL ALTERNATIVES

**Mrs. Hoeber.** That is one of the three options we are considering. We have three different alternative plans that we are evaluating through the environmental impact process.

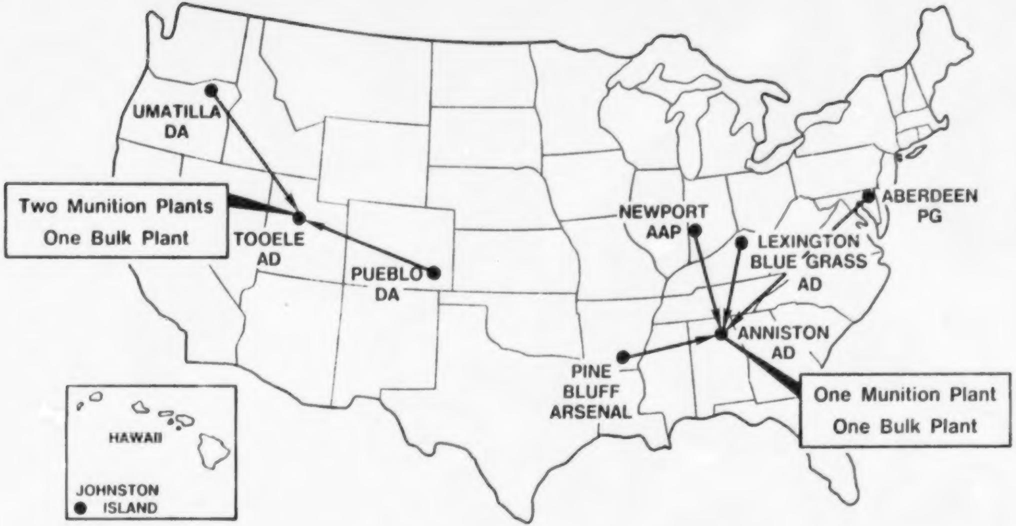
Those include a national facility—do we have a chart with that—a national facility which would be built at Tooele Army Depot as shown here, and in that case, if that is the choice, we will move all the munitions from the various facilities as indicated here to Tooele for demilitarization.

[Slides follow:]

# NATIONAL DISPOSAL ALTERNATIVE


UMATILLA DA
Three Munition Plants
Two bulk Plants
TOOELE AD
PUEBLO DA
NEWPORT AAP
ABERDEEN PG
LEXINGTON BLUE GRASS AD
ANNISTON AD
PINE BLUFF ARSENAL
HAWAII
JOHNSTON ISLAND

## REGIONAL DISPOSAL ALTERNATIVE


UMATILLA DA
Two Munition Plants
One Bulk Plant
TOOELE AD
PUEBLO DA
NEWPORT AAP
LEXINGTON BLUE GRASS AD
ABERDEEN PG
ANNISTON AD
PINE BLUFF ARSENAL
One Munition Plant
One Bulk Plant
HAWAII
JOHNSTON ISLAND

Mrs. **Hoeber**. Our second alternative is regional sites. We would build one at Anniston and once at Tooele, and move the munitions from the facilities to those two regional sites.

Our third alternative is to build a demilitarization facility at each of the sites.

Mr. **Miller**. But that determination has not been made as yet?

Mrs. **Hoeber**. That is correct.

Mr. **Miller**. And we are up to the point where some of the canisters are leaking and we still have not made the determination as to how we are going about destroying them?

Mrs. **Hoeber**. Not in terms of where the facilities will be located yet. That is a long process. We were not planning originally to demilitarize the entire stockpile until last year.

Mr. **Miller**. I understand 90 percent of it.

Mrs. **Hoeber**. We will demilitarize all unitary munitions. We were directed to do so by 1994 by Congress last year, and we have a plan which has been submitted to Congress to accomplish that.

But in order to do this, we have to go through the environmental impact statement process, and this requires many months of public hearings, of analyses, of filing notices with various other Federal agencies, and this takes that long.

We will not make a record of decision as to the location of the facilities until next January.

Mr. **Miller**. And how long will it take for construction of the facilities once that decision is made as to which of the three types would be used?

Mrs. **Hoeber**. There is a chart in the plan that has been submitted to Congress. It takes, I think, approximately two years to build the various facilities, and we will have accomplished all of the demilitarization by 1994.

Mr. **Miller**. Do we have at any one of those locations an extremely large amount of the chemicals?

Mrs. **Hoeber**. Yes, sir. Most of them are stored at Tooele.

### CURRENT DEMIL

Mr. **Miller**. What about today? There is the 1994 date, but if we have a canister leaking today, we cannot allow that to go into the air.

Mrs. **Hoeber**. That is correct.

Mr. **Miller**. Do you have another canister that it can be put in and sealed?

Mrs. **Hoeber**. Yes, sir. We have two mechanisms for taking care of that program. One of them is called DATS, a drain and transfer system, which goes from location to location and takes the leakers in each place, drains them and empties the agent into a separate secure container and it is thus protected.

Our second methodology where the DATS is not present is to take the leaking munition and encase it in another container that is sealed, and therefore the agent does not disseminate into the air.

Mr. **Miller**. Could you tell us about how many of those containers were ruptured or about to rupture and had to be moved into the second container? Do you have a lot of those?

Mrs. **Hoeber**. Not a lot. Several hundred.

### COST OF DEMIL

Mr. **Miller**. And do you have estimates of what it would cost for building each of those facility sites? In other words, is it a lot more expensive to build the facility site for destruction at the location where the chemicals are now and not have to transport them?

I understand transporting could be quite an expensive problem. Maybe they would all have to be into a second shell in order to transport them.

Mrs. **Hoeber**. The costs are described in detail in the report submitted to Congress last month. It is approximately $2 billion, no matter which way you go. The transport is of course expensive, although one would save money by building fewer facilities that way.

Mr. **Miller**. Are you recommending or are you in a position for your people to recommend which of the three alternatives should be adopted? Who makes that recommendation?

Mrs. **Hoeber**. The recommendation will be made by the Army when we provide our draft environmental impact statement the 1st of July. We will make our preferred alternative judgment at that time, and I am not prepared to comment on it today because of the environmental impact process.

That requires us to put out our preferred alternative in the draft statement in July. It will go through then public hearings of one sort or another, congressional hearings. We will receive comments from the public. We will then do some reevaluation, a recommendation will be made to Secretary Marsh by the rest of the Army in early January of 1987, and he is expected to make his decision in January of 1987.

Mr. **Miller**. Well, it sounds like the environmental concerns from the public could put this off forever.

Mrs. **Hoeber**. I hope not, sir.

Mr. **Miller**. Because we have people in congressional districts saying "This needs to be done, but not here." We run into that in connection with toxic waste disposal plants: "do it, but not here."

Mrs. **Hoeber**. Yes, sir.

Mr. **Miller**. So in this case, will you be able at the public hearings to assure those people that somehow, in destroying the chemical munitions, you are going to be able to filter what will go out the flue or however it is going to be destroyed so that is will not be toxic when it comes out?

Mrs. **Hoeber**. That is right. We have a very safe system. We have proven it over and over in our pilot plant facility at Tooele.

We are now in the process of building a full-sized facility at Johnson Island in the Pacific where we also have stocks of chemical munitions and that will be fully operational in the not too distant future.

We have taken delegations from the various areas surrounding the depots of the Tooele pilot plant to demonstrate how we do this and how safe it is and the degree of monitoring and safety concern that we apply.

Mr. **Miller**. You spoke also of the thousands of tons—now, are we talking about tens of thousands or hundreds of thousands of tons that need to be destroyed?

Mrs. **Hoeber**. ———.

Mr. **Miller**. And you also spoke of the shells that were now available, but we do not have launchers for them.

Mrs. **Hoeber**. That is included.

Mr. **Miller**. Each one of those, though, is a separate shell that would have to be opened and destroyed?

Mrs. **Hoeber**. Yes, sir.

Mr. **Miller**. What volume of material would be in a shell?

Mrs. **Hoeber**. It various from type of shell to type of shell. The rocket launchers have 10½ pounds of agent in them. Artillery shells have a little more, about the same. The bombs have more.

There is a lot more agent in the big bulk storage drums. But we have developed a mechanism for handling each particular munition in our process.

Mr. **Miller**. It sounds like there is a lot of mechanical work connected with this as well as destroying the chemical.

Mrs. **Hoeber**. Yes, sir, that is exactly right, and that has been one of our problems, because all of that mechanical work has to be very safe and very reliable. But we have developed ways of doing it for each particular munition. That is one reason why it has taken us so long to develop a safe and secure process.

Mr. **Miller**. On those canisters that you are putting in the second canister, heavier wall, different material, are they designed in such a way so that if you drilled into that canister, you could hit the second canister and be able to remove the material without opening this and having a dangerous situation where the worker would be exposed to the chemical?

Mrs. **Hoeber**. No. What we do in that case is we have a safe and secure area where the leaking munition is removed from its outer shell and handled within a contained area in the demilitarization facility.

Mr. **Miller**. Thank you.

Thank you, Mr. Chairman.

Mr. **Hefner**. Mr. McDade has a couple of questions, I think.

### GB-2 Artillery Projectile

Mr. **McDade**. Thank you, Mr. Chairman.

I want to talk about the GB-2 artillery projectile.

The budget includes $60.6 million for procurement of ——— GB-2 binary chemical artillery projectiles. In fiscal year 1986, $21.7 million was appropriated for the initial procurement of ——— rounds, but bill language prohibited obligation of these funds until after the beginning of fiscal year 1987.

Since obligation of fiscal year 1986 funds cannot take place until 1987 at the earliest, why are additional funds required in fiscal year 1987?

Mrs. **Hoeber**. Well, to continue the process, sir. You know, it would delay the whole artillery procurement a year if we had no 1987 funds.

Mr. **McDade**. In effect, you do but it is fiscal year 1986 money. You can't obligate it until fiscal year 1987.

Mrs. **Hoeber**. We intend to obligate the first day of the next fiscal year assuming we have met all the constraints imposed by Congress so far.

Mr. **McDade**. It looks like you are getting a double dip in fiscal year 1987. Can you spend that money efficiently?

Mrs. **Hoeber**. Yes, sir.

Mr. **McDade**. The whole $60.6 million would be for procurement?

Colonel **Carruth**. The 1986 money would be two to three months production, so you would start up the plant and shut it down again if you don't have the 1987 fund to be able to continue the production.

Mr. **McDade**. For the record, show the projected contract dates, procurement lead time and monthly deliveries for fiscal years 1986 and 1987.

[The information follows:]

Projected contract dates: FY86 and FY87: Oct86 and Jan87.

Procurement leadtime: Initial, 21 months; and Reorder, 12 months.

Monthly deliveries (k/mo): ———.

Mr. **McDade**. Last year, we were told that the Army would buy a total of ——— of these projectiles for a total cost of ———. What changes to these figures have been made since last year, and why?

Mrs. **Hoeber**. Can we provide that for the record?

[The information follows:]

The Army procurement objective for the GB-2 artillery projectile remains at ———. Due to a decline in the inflation rate in the general economy, the total cost to procure these projectiles is now ———.

Mr. **McDade**. Are the projectile procurements in fiscal year 1986 and fiscal year 1987 fully funded?

Mrs. **Hoeber**. Yes.

Mr. **McDade**. Do the requested amounts represent the total cost of buying and assembling these rounds?

Mrs. **Hoeber**. Yes.

Mr. **McDade**. The Army currently has no facility to manufacture the chemical DC, which is a precursor to one of the two chemicals in the GB-2. We were told last year that there was sufficient DC in bulk storage to load ——— projectiles.

Therefore, only ——— of the ——— projectiles funded in fiscal years 1986 and 1987 can be loaded with DC currently available.

Where will you get DC for the remaining ——— projectiles?

Mrs. **Hoeber**. We are looking at that at this point. Our options are at Pine Bluff arsenal, Arkansas, Lake Charles, Louisiana, where Olin Company performs, West Helena, Arkansas, with Vertac, the phosphate works at Muscle Shoals, and the Newport Army ammunition plant in Indiana.

We expect to have a solicitation out in 1986 for the contract award to follow in January 1987.

Mr. **McDade**. That is for production of the new facility?

Mrs. **Hoeber**. DC facility would be a new facility.

Mr. **McDade**. You are never going to get it done in time, are you?

Mrs. **Hoeber**. We believe we will.

Mr. **McDade**. You are going to go to contract in January of 1987, and you think it will be built and services ——— projectiles in fiscal year 1987?

Mrs. **Hoeber**. It comes on line in September of 1988.

Mr. McDade. Where will the GB-2 projectiles be stored once they have been produced?

Mrs. Hoeber. Tooele, Anniston and Pine Bluff.

## Chemical Weapon Stockpile

Mr. McDade. I would like to have the slide up again that shows the percent usable and the percent not usable.

Mrs. Hoeber. All right. Let's put the classified version up since that has all of the numbers as well.

Mr. McDade. I would like you to talk us through concisely, but as quickly as you can, from the part that is totally unusable all the way up and tell us, flesh out the reasons that all of those particular components of the current stock are not usable with the exception of the 10 percent.

Colonel Carruth. In the bottom group are what we call the bulk agents and those are stored in what is called a one-ton container, a standard industrial type container that is used to transport gases such as chlorine throughout the country. Those we have no filling facilities and ———.

In the next group, the unrepairables——

Mr. McDade. Is that 61 percent?

Colonel Carruth. Sixty-one percent is the bulk agent, obsolete and unrepairable, 11 percent; those have some kind of defect, either some were when they were forged, there were defects in the forging and the metal in the projectiles is bad. It would be unsafe to fire. That is in the unrepairable.

The GB artillery and the HD, the ——— round and the ——— round are for the 155-millimeter guns. We no longer have 155-millimeter guns in the inventory. The M-55 rockets, we have no launchers for those rockets. They were built on a crash program during the Korean War.

The munitions developed dispersion problems in the surveillance firing that was done, and they were considered not usable on the battlefield.

Mr. McDade. You said that we have no 155 launchers?

Colonel Carruth. No 155 guns.

Mr. McDade. What do you mean——

Colonel Carruth. A gun is a longer barreled, a howitzer is normally a direct-fire system; it goes up to a high altitude and you can shoot behind hills. We have 155 howitzers but not guns.

There is a difference in the shell. On an artillery shell, you have the rotating band which seals in the gases when you fire it. For the gun that is much broader and wider and if you tried to fire the same ammunition in a howitzer, you would probably expolde it because the chamber pressure would be so great in trying to get the shell out. We no longer have the guns.

The next group we call 18 percent of limited value. Spray tanks for VX, the normal operating mode for that spray tank is to come in at 100 to 200 feet at about 350 knots. That is where the Air Force is not too happy in today's air defense environment to come in over targets and deliver those. That is why we say that is a limited value.

The land mines, VX, we would have to emplace those ourselves in the battlefield. We expect a highly mobile operation. To put out a land mine that has persistent agent would be a danger to ourselves if we had to maneuver through there and even if the enemy detonated the mines, we would put out a persistent agent that could impact on our operations plus the fact that with our no-first use, they will be on us before we would have a chance to deploy them.

Artillery GB, that is 105-millimeter artillery rounds. The 105 is, except for some of our light forces, we don't have the 105 artillery. It has a very short range and it carries a very small amount of agent. Each round only has about ——— pounds of agent to get a sufficient concentration on the battlefield, you would have to tie up your direct support artillery weapons firing forever.

The mustard artillery and the mortar, again, persistent chemical agents, doesn't fit the air/land battle doctrine. We would limit our own operations and that takes us up to that 90 percent that we say is not usable.

Mr. McDade. Would you describe the useful supply, to distinguish between that and the others?

Colonel Carruth. The GB, bombs, they are put up there as useful, although they don't meet our doctrine, because with a bomb system we want to hit deep targets and a persistent agent, something that would cause the enemy to decontaminate or remain in protective clothing. We can deliver this without endangering the air crew and we are able to use our modern aircraft to deliver those systems and to get the pilots and the aircraft back safely.

The artillery VX, we can shoot it in our 155 and eight-inch artillery. We can achieve target coverage. However, it is the wrong agent mix in some regards because it is going to put a persistent agent in close to our own forces.

The artillery GB, basically it is the same type of agent that it will be in the 155 binary, but we have all the inherent problems that we have with the unitary artillery projectile in that we have lethal agent and you have heard from the Navy their problems in transporting unitary kind of munitions.

Mr. McDade. Thank you, Colonel.

Thank you, Mr. Chairman.

Mr. Hefner. Mr. Dicks.

## CHEMICAL DEFENSE EQUIPMENT

Mr. Dicks. We talked a lot about the retaliatory weapons. Let's talk a little bit about the equipment for the servicemen and women.

Where do we stand on that by Service?

Dr. Welch. We are in general certainly getting better. We have over the last few years been able to put into the field the masks and the over garments to the point where the Army now has in Europe an over garment to go to war in and two more for the soldier as a backup. A great deal of that $815 million that we are asking for this year will continue that process.

Our total request this year is down from what it was last year. We are not asking for 8 percent over inflation or anything like this.

Mr. DICKS. What problem areas are there with the Army, Colonel?

Colonel CARRUTH. As far as the individual protection, we have a current family of systems in the field. The program for the procurement of a new mask and it continues to build on our war reserve stocks so we have those that would back up what we have.

We are not totally happy, of course, with the detection and identification stand-off capability so that we don't have to wait for the chemical agent to arrive in our location before we can detect it, that we would be able to see it some distance away, so that we can put on this protection before it arrives at our location and has the potential of producing casualties.

Mr. DICKS. Tell us about that detection. What are you trying to do? What are the programs? What are we working on for that early accident detection?

Colonel CARRUTH. Two basic—one is near term, a passive infrared system which by looking at temperature differences in certain wavelengths can detect the presence of chemical agent cloud; by differentiating between the background and the agent cloud, it can tell us whether or not there is a chemical agent moving toward our location.

The follow-on systems we are looking at are based on laser detection, the same kind of technologies, they will be able to scan and locate the chemical agent cloud as it moves toward our location.

Mr. DICKS. You say in your statement, Dr. Welch, that the Air Force mask is an issue.

Dr. WELCH. It is not an issue. The Air Force mask is being produced and the Air Force is happy with it.

I am happy with the bottom line for the Air Force. Their sortie rate at air bases drops ———. They can correct that and maintain a ——— sortie rate if they continue to buy the underground shelters.

Mr. DICKS. For the airplanes——

Dr. WELCH. For the people, the crews, so they can get out of this cumbersome garment and mask and rest and sleep and eat, and then go back out. If they do that, we are certain they can maintain a ——— sortie rate. That is ———. too. It keeps coming back to the fact that if you can't put the opponent into the same condition, you will lose the war very quickly or reach for nuclear weapons more quickly than you want.

It is not sufficient and it is for this reason that we are highlighting today the necessity to produce the production of the 155 mm artillery and BIGEYE bomb.

Mr. DICKS. What are you doing about these underground facilities?

Dr. WELCH. The Air Force is buying them at a good rate consistent with other budget responsibilities. They do make a big difference.

We are urging the Army to look at systems for their prepositioned stocks and depots in Europe, some of the fixed parts of the

Army and urging the Navy to do the same thing for some of their fixed facilities.

Mr. **Dicks**. What other problems does the Air Force have on defensive strategy? How about detection; is that a problem for them?

Dr. **Welch**. It is a problem, but they are working to correct it. They have produced and are buying the same detector that the Army is buying. They need a stand-off detection system and they are doing the R&D to do that.

Mr. **Dicks**. How about the Navy, Admiral?

Admiral **Flatley**. Accepting the incapacitation that comes with this equipment, we are ———. We are buying the Air Force mask because we are happy with it——

Mr. **Dicks**. For your pilots?

Admiral **Flatley**. And ships' crews. You are talking basically about sailor equipment here. We are looking at a collective protection system for our ships and the first prototype of that is on an amphib LHA right now, the Belleau Wood. We won't see another of those until the early 1990s.

I took Saratoga to SLEP in Philadelphia, the first ship to get that expensive modernization. We didn't spend a cent on hatches. We need to protect our troops. Our ships are beyond the price of going back and fixing for airtightness. We are building them better at this point, but it is not something we can go back and fix. There is not enough money so we are very reliant on the equipments, the masks and protective suits and maybe if we can make this collective protection system affordable, we can sort of build citadels in each of our ships where people can retreat to. You stop fighting the war then. But equipments are coming and we need the bucks to keep buying them because we are only about a tenth of the way there.

Mr. **Dicks**. What about people who are going to be in the tanks, or infantry fighting vehicles; do they wear the same uniforms?

Mrs. **Hoeber**. Well, in the case of the mask, the tanker's mask is a different variant of the infantry masks.

Mr. **Dicks**. Are all the tankers equipped?

Mrs. **Hoeber**. Yes.

Colonel **Carruth**. Yes, sir.

Mr. **Dicks**. How about our allies?

Mrs. **Hoeber**. It varies from allied country to allied country. Some of them are in reasonably good shape and some of them are less.

Mr. **Dicks**. One thing I want to come back to. In your statement you say—a growing concern is that the Soviet Union has managed to produce some novel and unknown agents ———.

So what sort of agents are you referring to? How do we even know about them if they are so novel and unknown? Is this just the paranoia that you go to bed with every night, Doctor?

Dr. **Welch**. That is a very real effect.

Mr. **Dicks**. How do we know? If they are novel and unknown—what is the evidence?

Dr. **Welch**. We know the following things for certain. For certain, for at least a decade the Soviets have had a corporate goal of developing new agents that would ———.

Mr. **Dicks**. You are saying that our defensive equipment would not be effective against these systems?

Dr. **Welch**. Not at all. I am saying as a prudent manager, those charged with raising and equipping armies, given all the circumstances—we can speculate as to whether ———. The only prudent path to follow, it seems to me, is to redirect our research and development program so that the defensive products are more universal, ——— and you can do some things that make sense here.

The detector systems as an example that we are putting into the field, recognize an agent by a mobility spectrum or by a fingerprint that is unique to the agent. It is a software program in the detector that is made to not respond to diesel fuel, but to other agents.

Once we identify ——— we can go out to the field and change the software program quickly and instruct it to respond to alarm if this shows up.

Perhaps more exciting is our use of———.

You don't have to know what the agent is.

Mr. Dicks. Are we developing a deterrent to these unknown systems and do we have a high-level effort at trying to come up with our own system that will overcome the defensive systems of the Soviets?

Dr. **Welch**. That is an excellent question. ———.

We are grappling with that question right now. Fortunately, as we have for the last ten years, we do have a program running at around $10 million a year as we have had for the last ten years, that looks at new chemical agents and looks at new chemical munitions. So we are keeping our R&D options open.

But what you are asking is a very important question.

Mr. **Dicks**. Is it just chemical or biological?

Dr. **Welch**. Only chemical.

Mr. **Dicks**. Under the 1972 treaty.

Dr. **Welch**. Under any circumstances we will not violate the treaty, which prohibits the possession of biological or toxin agents.

We believe the Soviets have violated this and we are not going to follow suit. We don't think it is necessary to recommend abrogating treaties, and so on.

The essence of deterrence is the unknown nature. If they feel they cannot protect against an unknown U.S. chemical agent, we feel they will be deterred from using chemicals to start a war.

Mr. **Dicks**. Thank you, Mr. Chairman.

### BIGEYE BOMB CHANGES

Mr. **McDade**. Mr. Porter of the Committee has several questions on this subject he would like answered for the record.

[Clerk's note.—Questions submitted by Mr. McDade for Mr. Porter and the answers thereto follow:]

**Question**. Dr. Welch, last year, the Congress rejected all production funds for the BIGEYE bomb. What major changes have been made in the design and performance of this troubled weapon?

Dr. **Welch**. First of all, I disagree with the characterization of the BIGEYE bomb as a "troubled weapon". If you examine other weapon systems at a comparable stage of development, e.g., AIM-7, AIM-9, Harpoon, etc., you will find many similarities. While these weapons did not initially meet all performance and reliability goals, their respective development testing programs led to increased knowledge and understanding of the weapons that allowed necessary modifications to be made to give us effective weapons.

I believe the testing program for the BIGEYE has accomplished the same thing. In 1982, after a tst event designed to push the pressure limits of the bomb led to a failure of the BIGEYE hardware, we made a major change in employment concept, going from on-station mixing to off-station mixing. Now instead of generating lethal chemical agent while being carried on an aircraft, no lethal agent is formed until the weapon is released and on its way to the target. Since the time of flight of the weapon in this delivery mode is less than 30 seconds, the pressure build up can never exceed the structural limits of the weapon.

As further testing was accomplished, we made other changes. In the fuze initiation system (FZU-37), we have lowered the threshold voltage in the electronic control module from 120 volts to 70 volts. Testing indicated this voltage had been set artificially high. We also tapered the mounting pads on the BIGEYE to improve the aerodynamics around the FZU-37. These changes have increased reliability.

The method of attaching the sulfur bags to the ballonet inside the BIGEYE has been improved to prevent damage to the bags while the ballonet is being transported.

We are also using a radar fuze known as the FMU-140 on the BIGEYE. This fuze is in parallel development for use on other weapons like the Rockeye, Gator, and APAM. BIGEYE testing has resulted in improvements for the FMU-140. These include better sealing of the fuze to prevent moisture intrusion, an improved battery to improve fuze reliability, and a better designed mounting bracket for this improved battery.

After completing the first phase of operational testing, the Navy judged the BIGEYE to be potentially operationally effective and suitable. This is the highest judgment accorded to *any* weapon system at this state of development and testing.

### BINARY FORCE PROPOSAL PROCEDURES

Question. Dr. Welch, I understand that Ambasssador Abshire, in testimony before the Senate Armed Services Committee, told the Congress that the North Atlantic Council would not be involved in approving a binary force goal despite the fact that Sec 8093 of the Continuing Resolution, as signed by the President, specifically delineates the North Atlantic Council, and not the DPC, for this decision. Why then did Ambassador Abshire choose to tell the Congress that he would only be going to the DPC and not the North Atlantic Council?

Dr. Welch. I believe Ambassador Abshire adequately addressed this in his testimony so I would like to quote from his remarks once again. Ambassador Abshire noted, "The current legislation speaks of approval by the North Atlantic Council, or the NAC, as we call it. As I have pointed out, it is the Defense Planning Committee that has jurisdiction over force goals. Because it is key to understanding the nuances of actions taken by NATO, let me review the distinction between the NAC and the DPC.

When France withdraw from the NATO's military structure in 1967, the alliance needed a separate forum to address issues related to defense, a forum where France could not be seated. This forum was called the "Defense Planning Committee."

The DPC took upon itself, with the agreement of France and the NAC, the military portfolio. Therefore, in matters related to the integrated military structure, the DPC exercises the authority of the NAC.

Mr. Chairman, since I prepared my testimony, I did some further research on this subject. In 1963, there was a Council memorandum that indicates the institution of the NATO force planning concept. This is while France was still in the Integrated Command.

The committee noted that it would not always be necessary for all members of NATO to meet in the planning group.

When the French withdrawal took place, in the Council summary records of 1966—when that withdrawal began; this is on 16 November 1966—there was adopted by the North Atlantic Council, with the French present, an extension of the activities of the DPC from the planning field to all integrated matters and all activities in which the French would not participate.

So, the grant of authority in relationship to the North Atlantic Council and the DPC is there. We consider the process that we are carrying out is in line with literally what your legislation says and within the spirit of the legislation it is an awkward way of expressing it."

Later on in his statement, Ambassador Abshire observed, "I would assume that it was in no way the intent of the Congress to rewrite NATO procedures, that where we find a slight language problem that is an inadvertency, there is no legislative intent to change a procedure . . . I just did want to point out for the record that I am assuming that where we run into such inadvertency, there is no intent to force the North Atlantic Council into a new procedure. The intent was to follow its procedure and to have the binary component to go into that regular procedure."

[CLERK'S NOTE.—End of questions submitted by Mr. McDade for Mr. Porter.]

Mr. HEFNER. Please answer the rest of the committee questions for the record.

[CLERK'S NOTE.—Questions submitted for the record and the answers thereto follow:]

### CLASSIFICATION OF CHEMICAL WEAPON BUDGET

*Question.* Who is in charge of determining the classification level for P-1 lines in the budget? Is it done by OSD or the Services?

Answer. The classification level for P-1 data on chemical programs is currently determined by the Services.

*Question.* What criteria or guidelines exist for determining the classification level?

Answer. Current guidelines on these chemical programs include Army and Air Force regulations which establish criteria for classification of chemical warfare information and the Navy's classification guide for the BIGEYE binary chemical bomb program.

*Question.* Why has a change been made from last year when the only classified figure was the GB-2 quantity?

Answer. Quantities of chemical deterrent systems are classified. Dollar amounts from which quantities may be calculated are also classified. The requirement to classify such information is derived from the fundamental need to maintain a degree of uncertainty with regard to overall military capability associated with deterrent systems. The effectiveness of the deterrent is enhanced when potential initiators of chemical warfare are uncertain as to the likely intensity and duration of our retaliatory operations. We will issue uniform guidance to the Services to ensure that this policy is consistently applied. There has been no change in classification guidance from last year. Publication of uniform OSD guidance will ensure consistent classification of the data in the future.

### CERTIFICATION REQUIREMENTS

*Question.* Section 8093 of last year's Appropriation Act requires that prior to obligation of production-related funds for chemical weapons the President must certify that the United States—has submitted a force goal to NATO and that this force goal has been approved by the North Atlantic Council; has developed a contingency deployment plan; and has consulted with NATO allies on the plan.

What actions have been taken to comply with this requirement, and when do you expect the certification will be submitted to Congress?

Answer. On May 15, 1986 the Defense Planning Committee (DPC) permanent representatives adopted the binary chemical weapons (CW) modernization force goal addressed to the United States.

On May 22, 1986 Defense Ministers in Defense Planning Committee (DPC) Ministerial Session concluded the process of adopting NATO Force Goals for 1987-1992, including the CW Force Goal for the United States.

Adoption by the permanent representatives of the Defense Planning Committee and the conclusion of the adoption process by Defense Ministers completed action on the Force Goals for 1987-1992. Force Goals are not the concern of the North Atlantic Council (NAC), on which France sits. After France announced in 1966 its intention to withdraw from the Alliance's integrated military structure, all of the authority of the NAC on matters related to the integrated military structure devolved, by agreement of the NAC and France, to the DPC. In these matters, the DPC is the compentent authority not the NCA. In matters related to the integrated military structure, the DPC exercises the authority of the NAC.

The contingency deployment plan has been developed in coordination with the Supreme Allied Commander in Europe and is in final staffing within the Joint Chiefs of Staff. Consultations on the deployment plan will take place as soon as it is approved, mostly likely in June or July 1986.

We expect Presidential certification that the requirements have been met by July 1986.

## BIGEYE CERTIFICATION

*Question.* The 1986 Appropriation Act also requires the Secretary to submit a report on the operational requirements and testing results of the BIGEYE bomb. What are you plans for complying with this requirement?

Answer. The Secretary's report will be issued by mid-June.

*Question.* The BIGEYE language permits the Secretary to make exceptions to the operational criteria if he deems it necessary. What such exceptions do you expect will be made and why?

Answer. It would be inappropriate for us to prejudge the Secretary's conclusions. If there are exceptions to the operational criteria, the rationale for them will be fully described in the report.

*Question.* There has been a long-standing disagreement between the General Accounting Office and your Department on the adequacy of BIGEYE tests and the results of the tests. For this reason, the conferees last year agreed that the DoD report would be submitted to GAO for review and certification. They also urged DoD to cooperate with GAO during BIGEYE testing and to fully share data from prior tests. What action has your office taken to comply with this direction?

Answer. We have provided the GAO copies of technical reports and documentation on BIGEYE, as well as the Navy's report on the first phase of their operational testing. In addition, we initiated several face-to-face meetings with GAO personnel in an attempt to discuss the test results, clarify any points of misunderstanding, and answer any questions that the investigators had about BIGEYE testing. GAO has also been provided an outline of the report to be submitted by the Secretary of Defense and the complete set of operational requirements and operational test criteria. It should, therefore, be possible for GAO to develop independently their own conclusions concerning BIGEYE performance against the specified criteria and thus facilitate their comments on the Secretary of Defense submission.

## NEW APPROPRIATION FOR CHEMICAL DEMIL

*Question.* The fiscal year 1987 budget proposes a new appropriation called "DoD Chemical Demilitarization Program" in the procurement title. What does this appropriation include?

Answer. This appropriation was generated to comply with the requirements of Section 1412 of Public Law 99-145 which states that "Funds for carrying out this section should be set forth in the budget of the Department of Defense for any fiscal year as a separate account. Such funds shall not be included in the budget accounts for any military department. Funds for military construction projects necessary to carry out this section may be set out in the annual military construction budget separately from other funds for such project." This chemical demilitarization appropriation contains operation and maintenance, procurement and research and development funds in separate budget activities.

The appropriation provides all resources, except for military construction, to support the destruction of lethal and incapacitating agents in the Chemical Demilitarization Program. Funds cover developments of new process and monitoring technology; engineering studies; environmental impact statements; Resource Conservation and Recovery Act (RCRA) and other permits; program management; equipment procurement, installation and testing; personnel training and operational readiness verification; munitions transportation; disposal operations and maintenance; disposal of waste products and decontamination of equipment and facilities and dismantling of process equipment at the conclusion of operations.

*Question.* For the record, provide a project by project list of all chemical demil programs not funded in this account.

Answer. This new appropriation will cover all the chemical demilitarization projects for the destruction of the complete chemical unitary stockpile. However, the current budget only includes a portion of the funding required for this program. The complete fiscal year 1987 requirement will not be known until the environmental impact statement is completed and a Record of Decision is made on the number and locations of chemical disposal facilities to be built. This appropriation will not include the funds required for the construction of the facilities. Those funds will be included in the Army military construction

*Question.* Why is a consolidated appropriation proposed for this program and not others?

Answer. Section 1412 of Public Law 99-145 directed that a separate DoD appropriation be established for the chemical demilitarization program.

*Question.* Why is it included in the procurement title since it also includes R&D and O&M?

Answer. Initially, the largest funding requirement is for procurement funds. Hence the procurement title.

*Question.* What is the out-year funding profile for this account, by budget activity?

Answer. The funding profile for this account was developed prior to determining the funding requirements for the disposal of the complete unitary chemical stockpile. Therefore, this funding profile is not consistent with the information included in the Chemical Stockpile Disposal Concept Plan, and does not provide the resources to meet the September 30, 1994 deadline.

The current funding profile follows. It does not include construction funds.

DOD CHEMICAL DEMILITARIZATION PROGRAM APPROPRIATION

| Budget activity | FY87 | FY88 | FY89 | FY90 | FY91 |
|---|---|---|---|---|---|
| R&D | $9.8 | 11.5 | 7.7 | | |
| Procurement | 49.8 | 50.0 | 15.0 | 10.2 | 14.8 |
| OMA | 60.5 | 74.9 | 76.2 | 120.3 | 120.6 |
| Total | 120.1 | 136.4 | 98.9 | 130.5 | 135.4 |

*Question.* The budget proposes to make this appropriation available for three years. Why should O&M and R&D funds be available for three years when all other such funds are available for one year and two years respectively?

Answer. The appropriated funds provide the resources to develop, test, construct, equip and operate industrial plants; an integrated and single objective. The O&M and R&D activities, in this case, are not independent nor do they support the classical type functions. Planning and executing this long range program requires the flexibility of appropriation continuity provided by the 3 year duration.

*Question.* The appropriation is in the Defense Agencies portion of the budget, while chemical demil funding has usually been appropriated to the Army in the past. Is the Army still the manager of the chemical demil program?

Answer. Yes, the Army still is the Department of Defense Executive Agent for chemical demilitarization. A new Program Manager Office for Chemical Demilitarization headed by an Army general officer, has been established under the US Army Materiel Command as prescribed by Public Law 99-145.

*Question.* What funds, is any, in this appropriation will *not* be transferred to the Army?

Answer. All the funds for the chemical demilitarization program will be transferred to the Army.

## CHEMICAL DEMIL PROGRAM

### PROGRAM PLAN AND COST

*Question.* Section 1412 of the 1986 Defense Authorization Act directs the Department of Defense to destroy the complete unitary chemical stockpile by September 1994 in conjunction with production of binary chemical weapons. A disposal plan was submitted to Congress on March 15, 1986. Summarize the plan for us.

Answer. The Chemical Stockpile Disposal Concept Plan was developed in response to a requirement set forth in Title 14, Part B, Section 1412 of the 1986 Defense Authorization Act. The law specifically directs the development of a plan defining an effective demilitarization program that is safe for the workers, the public and the environment. The complete unitary chemical stockpile must be destroyed by September 30, 1994, in conjunction with production of binary chemical weapons. The plan addresses the destruction of the entire lethal chemical stockpile in the continental United States and on Johnston Atoll. It does not address destruction of stocks stored in Western Europe, which will be considered separately. Plans for the destruction of those stocks will be developed in coordination with the Federal Republic of Germany.

Successful implementation of the plan rests with several basic assumptions—first, that funds for the program are appropriated as requested; second, that the environmental process can be accomplished without undue delays; and third, that simultaneous construction of disposal plants is acceptable.

The development of the concept plan is based on the evaluation and comparison of three alternatives mandated by Congress for the disposal of the stockpile. The three alternatives are: (1) on-site disposal with stocks destroyed at their current storage locations, (2) collocation of stocks to two regional destruction centers, and (3) collocation of stocks to a national destruction site. Specifically, the onsite alternative would construct disposal facilities at Aberdeen Proving Ground, Maryland; Anniston Army Depot, Alabama; Lexington-Blue Grass Army Depot, Kentucky; Newport Army Ammunition Plant, Indiana; Pine Bluff Arsenal, Arkansas; Pueblo Army Depot Activity, Colorado; Tooele Army Depot, Utah; and Umatilla Army Depot Activity, Oregon. The regional destruction alternative will require transportation of the chemical stockpile to Anniston Army Depot, Alabama in the East and to Tooele Depot, Utah in the West. The national destruction alternative will require transportation of the chemical stockpile to Tooele Army Depot, Utah. In all three alternatives, the stockpile on Johnston Atoll will be destroyed there.

Each of the alternatives is based on utilizing the existing Johnston Atoll Chemical Agent Disposal System (JACADS) design documents modified to conform to the site physical and environmental conditions, and to the types and quantities of munitions stored. The facilities will remain JACADS size, and will be utilized in multiples for those alternatives where additional capacity is required.

The total program funding requirement for each of the alternatives is estimated to be $1,960 million for a national destruction center, $1,864 million for regional destruction centers, and $1,972 million for on-site destruction.

The plan includes the program cost, schedules, and detailed descriptions of such activities as acquisition, operation, transportation, verification, and subsequent facility closure and disposal for each alternative.

*Question.* Last year, the Army testified that "we are looking into the first part of the next century before we are through with the whole stockpile." Will your plan completely comply with the requirements of the law to have all unitary weapons destroyed by September 1994? If not, why not?

Answer. Yes, the schedule included in the Chemical Stockpile Disposal Concept Plan would complete the destruction of the unitary chemical stockpile by September 1994. However, the schedules are based on the assumptions that the funds for the program are appropriated as requested, the environmental process can be accomplished without undue delays, and simultaneous construction of disposal plants is acceptable. Also the published schedule does not provide for the incorporation of the cryofracture technology.

*Question.* What are the advantages and disadvantages of the three alternatives addressed in the plan?

Answer. The advantages and disadvantages of each of the alterantives will be discussed in detail in the environmental impact statement. All of the information is not yet available. The comparative anlysis used for all of the alternatives will stress safety and environmental impacts. The specific criteria are listed in Chapter 8 of the Chemical Stockpile Disposal Concept Plan and include susceptibility to sabotage or terrorism, technological complexity, likelihood of incurring casualties, program cost, schedule, regulatory compliance, potential impacts of large-scale accidents, and risk distribution.

*Question.* When the plan was submitted, Under Secretary of the Army James Ambrose wrote that the schedules in the plan "represent some degree of risk and may not be the most cost effective ways to achieving the goal." What is the nature of the risk?

Answer. The risks referred to in the letter are schedule risks and not safety or environmental risks. These schedule risks arise primarily from the fact that although all parts of the Johnston Atoll type facility will have been tested individually, they will not have been tested as a part of a full scale operational facility. As indicated in the Under Secretary's letter, it would be more prudent to complete and operate the Johnston Atoll facility so that successor facilities could be modified as necessary to improve reliability and achieve lowest operating costs. Safety of the public and work force and protection of the environment will not be sacrificed to meet schedules.

*Question.* Mr. Ambrose observed that it would be much more prudent to complete the Johnston Atoll facility and simultaneously continue development work on cryofracture technology.

When will the Johnston Atoll facility be completed and tested?

Answer. The Johnston Atoll Chemical Agent Disposal System (JACADS) will be constructed, tested and ready for toxic operations by the fourth quarter of fiscal year 1989.

*Question.* When will you have sufficient experience from cryofracture work to know whether it is a more economic appoach?

Answer. The cryofracture development consists of a two step data gathering process (1) technical feasibility tests with actual chemical munitions using the Chemical Agent Munitions Disposal System (CAMDS) facility at Tooele Army Depot, Utah and (2) system operations at a full scale demonstration module, also at Tooele. The technical feasibility tests will provide only preliminary cost information by September 1987. A more complete data base for predicting the savings from the cryofracture system will be available in 1992, after initial system operations are conducted at the demonstration module.

*Question.* If Mr. Ambrose's approach is followed, when would the stockpile be demilitarized?

Answer. For the baseline technology, the complete stockpile would not be destroyed until 1997. The Under Secretary would like to have at least a year of JACADS operations completed before the disposal facilities in the continental United States are constructed (FY 1991-1994). It will take three years to complete the destruction of all the munitions (FY 1997).

For the cryofracture technology, the stockpile would not be destroyed until 1998. The cryofracture testing will be completed by the end of FY 1987. The full scale demonstration module can be constructed between FY 1988-1991. A year's worth of operation would be required prior to construction of follow-on facilities (FY 1992-1995). Toxic operations would last till 1998.

Baseline: Build JACADS (FY86-89); Toxic Opns (FY89-90); Construct other facilities (FY91-94); Destroy Stockpile (FY94-97).

Cryofracture: Test Cryofracture (FY86-87); Build Demo Module (FY88-91); Toxic Opns (FY91-92); Construct other facilities (FY92-95); Destroy Stockpile (FY95-98).

*Question.* What savings would this approach achieve?

Answer. Preliminary data indicate savings by using the cryofracture process could be as high as $300 million. The savings are estimated from the reduced requirement for material handling equipment. No projected savings are estimated with the baseline technology, but the completion of the disposal program would be a year sooner. However, extension of the completion date will cost approximately $50 million per year for storage, maintenance and security.

*Question.* The costs of your three alternatives are all estimated to be about $2 billion. Why is only $621 million included in the current five year defense plan?

Answer. The five year defense plan was developed when the demilitarization program only included the M-55 rocket for disposal. The $621 million included the disposal facilities at Pine Bluff Arsenal, Arkansas, Johnston Atoll in the Central Pacific and up to three other M-55 disposal facilities. Public Law 99-145 directs the Defense Department to destroy the complete unitary stockpile by September 1994 in conjunction with the production of binary weapons. The fiscal year 1989-1993 five year defense plan will be developed to reflect the added requirements based on disposal of the entire chemical stockpile by September 30, 1994.

*Question.* What additional funds are required? Provide the details, by fiscal year, for the record.

Answer. The total additional funds required above the $621 million is dependent on the alternative chosen. Since the on-site disposal alternative requires the greatest initial expenditures, that alternative will be used to provide an example of the funds that are required.

Budget Activity 1 RDTE—Requirements are being revised based on direction to accelerate development and testing of cryofracture technology for possible application for disposal of the chemical stockpile by 30 September 1994.

INFLATED (THEN YEAR)

[In millions of dollars]

| | FY87 | FY88 | FY89 | FY90 | FY91 |
|---|---|---|---|---|---|
| Budget activity 2 procurement | +496.5 | | | | |
| Budget activity 3 O&M | +6.9 | +10.2 | +12.8 | | +133.9 |

In addition, requirements for FY88 (then year) for facilities construction are $196.5 million MCA.

*Question.* Will the BZ facility at Pine Bluff be capable of doing demil on other chemical munitions stored there? Please explain.

Answer. The BZ facility currently being constructed to Pine Bluff Arsenal, Arkansas will initially be configured to dispose of BZ agents and munitions. If the one-site disposal alternative is chosen, modifications to the facility and the installation of additional process equipment will be required prior to processing lethal chemical agents. After the aforementioned changes are completed, the facility will be capable of disposing of all chemical agents and munitions currently stored at Pine Bluff. These costs are included as part of the added program requirements for the concept plan.

*Question.* What is the capacity of the prototype demil facility at Tooele? How is it different from the one being constructed at Johnston Atoll.

Answer. The Chemical Agent Munitions Disposal System (CAMDS) at Tooele Army Depot, Utah is a test bed facility used to prove our disposal equipment and processes prior to designing a full scale facility. It is modularized to facilitate replacement of systems. The Johnston Atoll Chemical Agent Disposal System (JACADS) is a full scale disposal facility housed in one large building.

CAMDS is limited by the capacity of its prototype liquid agent incineration to an agent destruction rate of 300 lb/hr GB, 200 lb/hr VX and 380 lb/hr H. This is approximately ⅓ the capacity of the JACADS liquid agent incineration. The Tooele facility has a single processing line, a small explosive containment vessel and limited buffers; while the Johnston Atoll facility contains multiple process lines, a large explosive containment area and buffers between process equipment to minimize downtime.

*Question.* What kinds of weapons can and cannot be demiled at Tooele?

Answer. The Chemical Agent Munitions Disposal System (CAMDS) is designed to dispose of all the types of chemical munitions in the stockpile. However, since it is a test bed and prove out facility, it cannot destroy these munitions at an economical "production rate."

## RESEARCH AND DEVELOPMENT

*Question.* The budget includes a request of $9.8 million for demilitarization R&D.

How much of this amount is for cryofracture, and how much is for the baseline system?

Answer. None of the funds support the baseline technology.

*Question.* What specific tasks are to be funded with these $9.8 million?

Answer. The specific tasks that are planned for fiscal year 1987 are the following:

(1) Continue the cryofracture process design which include efforts involving the robotic handling equipment in the processing line, the liquid nitrogen containers which will super cool the munitions and materiel, the fracturing hardware, and incineration using the rotary kiln. These various portions of the "Cryofracture design" will be tested using the Chemical Agent Munitions Disposal System (CAMDS) facility.

(2) Test munitions and materiel in the various stages of the processing effort for identification of required engineering changes.

(3) Acquire processing equipment for testing at CAMDS, Tooele Army Depot, Utah.

(4) Systems analysis of the resulting test data.

*Question.* After a period of reexamination at the end of last year and early this year, the Army has elected to continue development of the cryofracture approach.

What specifically is the program now in place?

Answer. The program is now planned to test the various components of the cryofracture process technology using real agents from actual munitions at the Chemical Agent Munitions Disposal System (CAMDS) facility. This testing is intended to prove the feasibility of the equipment and technology for installation in a production level disposal facility (demonstration module). If the decision is made to use the cryofracture process for future disposal facilities, the demonstration module will be constructed. Its facility and process designs would be the basis for other cryofracture facilities.

*Question.* What contracts have been let to implement that program?

Answer. The existing contract with GA Technologies has been amended to incorporate the use of CAMDS as the vehicle to test the various components of the cryofracture technology as opposed to the original plan to build a 1/10 scale facility to test out the system's parts. Other contract awards are pending equipment design resulting from the CAMDS facility tests.

*Question.* What are the milestones for the program?

Answer. Milestones for the proposed program are:

| | |
|---|---|
| Design demonstrations module | Aug 1987 |
| Complete feasibility testing at CAMDS | Sep 1987 |
| Decision on demonstration module | 1988 |
| Complete construction of demonstration module | Jan 1990 |
| Complete facilitization of demonstration module | Jan 1991 |
| Start Toxic operations | Jan 1991 |

*Question.* It is yet to be decided whether a centralized or decentralized approach to chemical demilitarization will be followed. Can the baseline system be used with either approach?

Answer. Yes, both technologies are applicable to the centralized or decentralized alternatives.

*Question.* When might a fully operational and proven-out baseline facility be available? A cryofracture facility?

Answer. The Johnston Atoll Chemical Agent Disposal System (JACADS) will be ready for toxic operations in fourth quarter fiscal year 1989, after a one year systemization and prove-out phase. The cryofracture fully scale demonstration module will be available for toxic operations in early fiscal year 1991, after a one year systemization and prove-out phase.

*Question.* When will a decision be made between a baseline or cryofracture system?

Answer. A specific date cannot be given at this time. Currently the testing of the cryofracture process with actual munitions is scheduled from July 1986 to September 1987. Until that time period, the full feasibility of the cryofracture process can not be determined. If the feasibility tests show the cryofracture process to be acceptable, a full size pilot facility will need to be constructed to develop operational data. The earliest a decision can be made between the two technologies is fiscal year 1988.

*Question.* Provide for the record a funding profile by fiscal year for the chemical demilitarization program if the baseline system is used, and if the cryofracture system is used.

Answer. *Baseline*—The funding profile cannot be determined until the Record of Decision is made in January 1987. Currently, the three alternative funding profiles are:

INFLATION (THEN YEAR DOLLARS)

| | FY87 | FY88 | FY89 | FY90 | FY91 |
|---|---|---|---|---|---|
| On-site alternative | 623.5 | 342.8 | 96.7 | 118.4 | 254.5 |
| Regional alternative | 455.3 | 242.3 | 95.2 | 110.1 | 350.6 |
| National alternative | 463.1 | 251.6 | 95.2 | 110.7 | 359.3 |

| | FY92 | FY93 | FY94 | FY95 | Total |
|---|---|---|---|---|---|
| On-site alternative | 403.0 | 288.6 | 164.4 | 14.7 | 2,306.6 |
| Regional alternative | 364.3 | 312.3 | 229.4 | 13.3 | 2,172.8 |
| National alternative | 393.8 | 342.5 | 255.2 | 16.8 | 2,288.2 |

*Cryofracture.*—The fiscal year funding requirements using the cryofracture technology are not available at this time. The funding profile will be developed once the process and facility designs are completed.

## PROCUREMENT

*Question.* The budget includes $49.8 million for procurement costs related to chemical demil. Of this, $19.6 million is for the Johnston Atoll Chemical Agent Disposal System (JACADS). Last year, you forecast a need for only $14.9 million in FY 1987 to complete this project. Why have the costs increased by 32 percent?

Answer. The $14.9 million requirement was developed in late 1984, prior to the receipt of the final design equipment cost estimate. The estimate at that time was $63 million for the furnaces, control systems, pollution abatement systems, monitoring equipment, etc., for the disposal of the M55 rocket. After the final design, the estimate for the equipment was raised to $68 million. This $5 million represents a 7% growth in the equipment cost. The $19.6 million is the remainder of the $68 million required.

*Question.* Justify the $6.1 million for "other" (ECP's, IPR's, and project management)

Answer. The $6.1 million "other" are contract related requirements in support of equipment procurement, installation and testing for the Johnston Atoll Chemical Agent Disposal System (JACADS). This includes prime contractor management, performance measurement and reporting, on island field office support, contractor participation during in-process review (IPR) meetings, and engineering change proposals (ECP) approved for incorporation into the plant during construction that require update of the design drawing to an as built condition.

*Question.* What are the total facility and equipment costs for JACADS?

Answer. The total facility and equipment cost of JACADS is $140 million, consisting of facility cost $40 million, general support and M55 rocket equipment $68 million and $32 million for equipment to dispose of remaining stocks on Johnston Island. The $32 million was appropriated in FY86 but has not yet been authorized.

*Question.* What will it cost to operate JACADS once it is completed?

Answer. Total operating cost for disposal of all chemical munitions currently stored on Johnston Atoll is estimated at $127 million. The annual operating cost will vary dependent on the munition type being demilitarized. However, the average annual operating cost approximates $30 million.

*Question.* Why are O&M costs for JACADS also included in FY 1987 when the plant will not be in operation until later?

Answer. O&M funds are required in FY87 primarily to provide for engineering support during construction, on island base operation support, planning for training and operations, and contract monitoring. The plant operations and maintenance contract will be awarded later this fiscal year, to facilitate the learning process and provide for orderly transition of plant responsibility between the equipment and the operation contractors.

*Question.* What chemical weapons are stored on Johnston Atoll and which ones will be processed by JACADS?

Answer. Johnston Atoll has a good representation of all the different types of chemical agents and munitions that are part of the total stockpile. The munitions below are arranged by agent:

*Mustard agent (H and HD)*—105mm projectile, 155 projectile, 4.2 in projectile (mortar), Ton container (bulk).

*Nerve agent (GB)*—105mm projectile, 155mm projectile, 8 inch projectile, M-55 rocket, MK-94 bomb (500 lb), MC-1 bomb (750 lb), Ton container (bulk).

*Nerve agent (VX)*—155mm projectile, 8 inch projectile, M-55 rocket, M23 land mine, Ton container (bulk).

*Question.* The budget also includes $28.7 million for "stockpile disposal facility." The budget was prepared without decisions on how many plants to build or what technological approach to use. What are the assumptions underlying your cost estimate? What, specifically, are the funds in the budget intended to procure?

Answer. Even though the total number of disposal facilities and the locations of all the facilities will not be determined until the Record of Decision is made (January 1987), the alternatives currently being assessed as part of the environmental impact statement have one common location—Tooele Army Depot, Utah. No matter which alternative is ultimately chosen (on-site, regional sites or national site), at least one multiple JACADS type disposal facility will be constructed at Tooele Army Depot. In order to meet the Congressional deadline of 1994, the disposal facilities must be built in fiscal year 1988. The Army has programmed $49.7 million for the construction of the Tooele facility. The $28.7 million procurement funds in fiscal year 1987 are to procure the long lead time equipment for the Tooele facility. The types of equipment required are furnaces, pollution abatement systems, control systems and material handling equipment.

*Question.* What are the milestones for Environmental Impact Statement (EIS) for this (or these) projects?

Answer. The programmatic environment impact statement Notice of Intent was published in the Federal Register on January

28, 1986. Currently, public scoping meeting and meetings with state and Federal agencies (through Environmental Protection Agency's region headquarters) are being conducted. The meetings started on April 17, 1986 and are scheduled to May 22, 1986. The remaining milestones are as follows:

File draft programmatic EIS—July 1, 1986.
Public hearing (as necessary)—July, August, 1986.
File final programmatic EIS—December 31, 1986.
Record of Decision on programmatic EIS—January 31, 1987.

## CHEMICAL WEAPON PRODUCTION FACILITIES

### DC FACILITY FOR THE GB-2 ARTILLERY PROJECTILE

*Question.* The budget includes $18.6 million or a facility to produce the chemical DC. DC is a component of DF which is one of the two chemicals in the GB-2 binary chemical artillery projectile. Last year, we were told that the Army would decide on a location for this facility in December 1985. What decision was made, and what factors were involved in the choice?

Answer. The Army has not made a final selection of a site. Several commercial and government sites are currently under evaluation. Our current schedule still calls for selection of a preferred site to support a follow-on Record of Decision by the Secretary of the Army in 3d quarter FY 1986.

*Question.* Is the $18.6 million in the budget, plus $2.5 million for prove-out, the total cost of this facility? If not, why not?

Answer. $18.6 million, plus $2.5 million for prove-out is the current Army estimate for total cost of the facility.

*Question.* What is the status of design for this facility?

Answer. Design is 35% complete for all candidate locations. This is the normal level for a design, build and proveout contract (turnkey).

*Question.* Why is the facility being designed with an annual capacity of ——— projectiles per year when the actual production contemplated in the budget does not ever exceed ——— projectiles per year?

Answer. The DC facility was designed to balance the fill line constructed with the FY 1981 M687 project. Since that time, requirements for the M687 have decreased. However, there are now requirements for the MLRS XM135 which uses the same fill.

*Question.* What is the basis of your cost estimate?

Answer. The cost estimate is based on formal engineering studies conducted by competitively selected contractors who are experts in construction and operation of chemical facilities.

*Question.* What type of contract will be used?

Answer. The contract to be used is firm-fixed-price for design, construction and proveout of the facility.

*Question.* For the record, provide the current milestones for this project.

Answer. Milestones for DC are as follows:

Record of Decision, July 1986.
Award Contract April 1987.

Begin Proveout, July 1988.
Complete Proveout, September 1988.

### GB-2 METAL PARTS EXPANSION

*Question.* The budget also includes $4.6 million for expansion of the metal parts facility for the GB-2 artillery projectile. According to the budget back-up sheets, this project will increase the capability of the current facility at the Louisiana Army Ammunition Plant from ——— per month. Since the Army will never produre more than ——— why is this project required?

Answer. The metal parts facility is a multi purpose line that will produce M483, M687 amd M825 metal parts. Buys for these three will exceed current capacity for the line, therefore, this project is needed.

*Question.* In the case of BIGEYE you are expanding production capacity for metal parts by establishing a second source. Why are you expanding capacity for the GB-2 by enlarging the existing facility?

Answer. To enlarge the existing facility entailed only the expansion of the tooling capability of the line. This presented a tremendous cost savings to the Government over building a new facility.

*Question.* What is the status of design for this facility?

Answer. The design is complete.

*Question.* What is the basis of your cost estimate?

Answer. The basis of the cost estimate is catalog price, inquiries and prices paid for previous identical tooling.

*Question.* What type of contract will be used?

Answer. The project will be accomplished under the operating contractors basic cost reimbursable contract; however, all equipment will be procured using firm-fixed-price sole contracts.

*Question.* What are the milestones for this project?

Answer. Schedule for metal parts expansion is:
Award Contract, January 1987.
Initiate Proveout, May 1988.
Complete Proveout, August 1988.

### EXPANSION FACILITY FOR BIGEYE METAL PARTS

*Question.* The budget also includes $15.4 million to establish a second source for metal parts for the BIGEYE bomb. Why is this the only element in the chemical weapons production program for which a second source is being established?

Answer. This is the only facility in the chemical weapon program for which a sufficiently large return on investment exists. It is projected so that the investment will be recouped in a very short time, and significant savings—projected at 20% of a nearly $1 billion program will be realized through this facility.

*Question.* What economic analysis was done to show that a second source strategy was cost-effective?

Answer. As part of the Bigeye program, the US Navy contracted for studies on the effect of competition on procurement of weapons systems. Army historical data on competition supports the Navy's results.

*Question.* When will the initial facility be completed and provenout?

Answer. The initial facility will be completed Nov 87 and proveout completed Mar 88.

*Question.* What will be the procurement strategy once the second source is completed?

Answer. There will be two production facilities that will be completed to determine the best price for the government. The lower cost producers will be awarded a larger percentage of the annual buy than the higher cost producers.

*Question.* What unit cost reduction, if any, do you project as a result of setting up a second source?

Answer. The projected cost savings approach 20% for the nearly $1 billion program.

*Question.* The new facility will expand total capacity from ——— yet the maximum procurement rate in the current five year budget is less than ——— in fiscal year 1991. What consideration has been given to a more modest expansion of the current facility rather than establishing a second producer which will give you over-capacity?

Answer. ———.

*Question.* How will you go about selecting a second producer? What criteria and selection factors will be used?

Answer. The second producer will be selected through full and open competition, using the government owned and approved design for the facility. Normal procurement practice, using cost and other factors will be used.

*Question.* What are the milestones for this project and for the initial production facility?

Answer. Milestones for initial production facility are:

Award contract, September 1986.

Initiate proveout, November 1987.

Complete proveout, March 1988.

Schedule for second source is:

Award contract, April 1987.

Initiate proveout, September 1988.

Complete proveout, January 1989.

*Question.* What type of contract will be used for each of the facilities? Last year, we were told that a cost-plus contract was contemplated. If this is still the case, please provide complete justification.

Answer. The initial production facility wil be acquired through a cost reimburseable contract (no fee allowed on facilities contracts). A cost reimbursable contract is being used since the BLU80/B is a complex weapon. The end item Technical Data Package (TDP) has not been validated through mass production. While the basic machine tools, cutting, forming, welding and assembly jigs and fixtures are well defined, the refinements necessary for high quality mass production are not. The risks are low, but because of the lack of refinement on the tooling, a cost reimbursable contract is, for technical reasons, more appropriate. The second source will be acquired through firm-fixed-price contracting.

## QL FACILITY FOR BIGEYE

*Question.* Last year, Congress appropriated $48 million for a facility to produce QL, one of the two chemicals in the BIGEYE bomb. The Department was to select a site for this facility early this fiscal year. What site was selected and what were the factors which lead to this selection?

Answer. The Army economic analysis favors Newport Army Ammunition Plant, Newport, Indiana; however, we are pursuing full and open competition to ensure the best price for the Government.

*Question.* Do you still expect that $48 million will be the total cost of this facility? If it has changed, please explain.

Answer. $48 million is still expected to be the total cost to design and build the QL facility.

*Question.* Provide the current milestones for this facility.

Answer. Award contract, August 1986; initiate proveout, July 1988; complete proveout, September 1988.

## BIGEYE LOAD, ASSEMBLE, PACK FACILITY

*Question.* Last year, Congress provided $28.3 million for a BIGEYE load, assemble and pack facility. In addition, $10.8 million was provided in the military construction bill. Do you still estimate that this represents the entire cost of this facility. If not, please explain.

Answer. Current bids recently opened for the MCA portion ($10.8M) indicate that the Army estimate was extremely accurate. We fully expect the $28.2 M appropriated for equipment to accurately represent the cost.

*Question.* Last year you testified that design for this facility would be complete by last August. Are final designs complete? If not, why not?

Answer. Final design for the facility has been completed for both the Military Construction Army and Procurement of Ammunition, Army efforts.

*Question.* What are the current milestones for this project?

Answer. Milestones for Bigeye fill/Load, Assemble and Pack building are:

July 1986--award contract for building construction.

October 1986—award contract for equipment manufacture.

May 1988—building complete.

June 1988—initiate prove out.

September 1988—prove out completed.

[CLERK'S NOTE.—End of questions submitted for the record.]

Mr. HEFNER. If there are no further questions, the committee stands adjourned until 1:30 p.m.

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